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Aging SNA faces a fight for its survival

BY MICHAEL COONEY

> "Will you still need me,
> will you still feed me,
> when I'm 64?"
> — *The Beatles*

SNA
— *turns* —
20

Systems Network Architecture, IBM's Bluest technology, celebrates its 20th anniversary this month safe in the knowledge that it is still the world's dominant network architecture but nervous about a future in which its influence could fade rapidly.

Traditional SNA — the Synchronous Data Link Control networks users know today — is giving way to other technologies that can better handle multiprotocol, high-bandwidth traffic and distributed applications.

Most analysts and users agree that SNA/SDLC could disappear in five years or so.

IBM is trying to persuade its large installed base to move to Advanced Peer-to-Peer Networking, the successor to traditional SNA. But while SNA still runs many businesses, the shift to client/server computing is forcing changes in network architectures that may preclude IBM if APPN doesn't catch on. If it doesn't, there may not be

See SNA, *page 12*

ALAN HARKRADER

Ron Sanderson is pushing the state of Illinois into the next generation of SNA technology. Page 13.

MCI comes from behind with ATM service launch

BY CHRISTINE HECKART

MCI this week will announce an ATM service so advanced it's likely to silence critics who say the company has been slow to deliver new broadband net services.

MCI's HyperStream ATM offering will provide several classes of service and a fixed-rate pricing scheme from nearly 400 locations nationwide. Scheduled to be available early in the fourth quarter, the service will support scalable access from T-1 through OC-3 (155M bit/sec), making it the first OC-3 ATM service available in the market.

Similar to its frame relay rollout, MCI's ATM strategy takes advantage of the latest in switching technology, General DataComm, Inc.'s (GDC) Apex switch. That stands in stark comparison to some other carriers' Asynchronous Transfer Mode platforms, which are now 3 years old.

"MCI's strategy was to wait until the market and technology firmed up before committing itself to a specific ATM platform, and that appears to have paid off in spades with this platform," said Gary George, president of G.S. George Group, a consultancy in Huntington Beach, Calif.

The move positions MCI to leapfrog existing competitive offerings. Sprint Corp. and WilTel are the only other major interexchange carriers with offerings on the market, although access providers such as Pacific Bell and Ameritech Corp. also offer ATM services, as does Metropolitan Fiber Systems, Inc.

AT&T initially announced third-quarter 1994 availability of an ATM service but is now promising only limited service availability this year with full commercial availability early in 1995.

The promise of ATM is its ability to support multiple services with scalable speeds, and MCI's offering pushes the envelope in both areas, said L. Thomas Walton, president of Walton and Walton Associates, an industry consulting firm in Richmond, Va. "It has multiple service classes and offers speeds from 1.5M up to 155M bit/sec. This may be the first ATM service that is more than just fast frame relay."

MCI's initial ATM offering

See MCI, *page 68*

ATM

Check out the technology at work on the network perimeter. Page 51.

Government demo shows that ATM could save your life. Page 4.

IBM allies with start-up to spearhead 25M bit/sec ATM movement. Page 7.

ENTERPRISE BACKBONES

3Com takes tunnel through non-IP nets

BY JIM DUFFY

Santa Clara, Calif.

3Com Corp. is embarking on a three-pronged plan to position Data Link Switching (DLSw) as a standard technique for tunneling any protocol through any type of backbone network.

The company will get rolling next year when it releases a version of its NetBuilder II routing software that supports DLSw over IBM Advanced Peer-to-Peer Networking nets. This will allow users to tunnel legacy Systems Network Architecture traffic through APPN backbones without the IBM-mandated dependent LU Requestor (dLUR) or dependent LU Server (dLUS).

See 3Com, *page 69*

Users dare to cross into border switch territory

BY SKIP MACASKILL

Waltham, Mass.

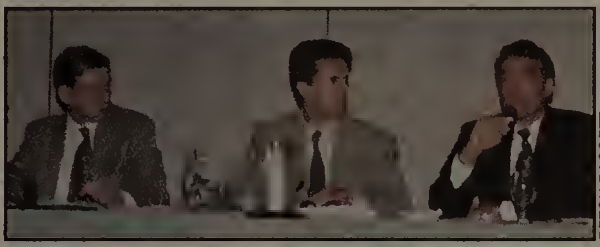
There's a lot of merit to the idea of installing special switches that marry shared-media LANs with ATM nets, but vendors of these so-called edge devices better be prepared to address questions about management, standards, interoperability and routing.

That was the message from a group of beta users who gathered here last week to talk with *Network World* at the launch of Agile Networks, Inc.'s entry into the border switch market.

The start-up's ATMizer Ethernet-to-Asynchronous Transfer Mode switch and accompanying ATMman network management application give Ethernet users what they need to get better performance out of existing networks and upgrade weary backbones to ATM (see story, page 19).

Like competing products from Centillion Networks, Inc., NetEdge Systems, Inc., NiceCom, Inc. and Xylan Corp., Agile's ATMizer acts as an ATM feeder node, giving LAN users access to network resources supported by an ATM switch or network. ATMizer also acts as a LAN switch, interconnecting users that are grouped in virtual workgroups, and working in conjunction with existing routers to move traffic between

See Switch, *page 69*


BETSY BASSETT

ATMizer users Kuhfuss (left) and Von Lichtenberg (center) listen to Marshall make a point.

Lotus, HP aim to pump up Notes

BY ADAM GAFFIN

Palo Alto, Calif.

Lotus Development Corp. and Hewlett-Packard Co. have quietly begun talking about ways to combine the replication and database capabilities of Lotus Notes with HP OpenMail's message-handling and management features.

The result could be an enterprise groupware server that would enable users to build

See Lotus-HP, *page 68*

PRODUCT REVIEW

And the *winners* are...

NETWORK WORLD TEST alliance

ZyXEL and **AT&T Paradyne** share top honors in this first-of-its-kind test of 10 cellular modems.

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NEWSPAPER

T00

Briefs

Amber waves of switching. Amber Wave Systems, Inc., a start-up based in Acton, Mass., next week will introduce its first product at the NetWorld+Interop trade show in Atlanta. The AmberSwitch is an Ethernet switch priced as low as $175 per port. An 80-port AmberSwitch will cost less than $2,000 and can be scaled up to 32 ports for about $5,600. President Curt Gridley declined to provide more details.

Amber Wave: (508) 266-2852.

IBM to retool FlowMark. IBM is set to unveil this month a version of its FlowMark workflow product that supports popular application development tools. The new version will let users FlowMark-enable applications built using IBM's VisualAge, Powersoft, Inc.'s PowerBuilder and Microsoft Corp.'s Visual Basic. The next version of FlowMark, due for release during the first quarter of next year, also will feature better server-to-server communication using IBM's MQSeries middleware.

Blasting the Bell bill. In a letter last week to Senate Commerce Committee Chairman Ernest Hollings (D-S.C.), the National Association of Regulatory Utility Commissioners said provisions added to the Communications Act of 1994 just before its committee passage will raise phone rates and bog down federal regulators. Many items were added to the bill in the late rush to gain support among senators and interest groups (*NW*, Aug. 29, page 1).

Less than Sterling results. Sterling Software, Inc. last week almost punted on plans to buy computer-aided software engineering vendor Knowledgeware, Inc. when Sterling learned that Knowledgeware did far worse in its most recent fiscal year than originally announced. Instead, Sterling will simply pay a lot less for the company quarterbacked by Fran Tarkenton — some $73 million instead of the $143 million first agreed on.

Such a deal. Proteon, Inc. last week closed its second software licensing deal in as many weeks, this time with IBM. IBM will add Proteon internetworking software to its 6611 router, to remote site routers it is codeveloping with Proteon, and to other internetworking products, possibly including its Nways line of cell switches. Proteon and Digital Equipment Corp. signed a similar agreement recently (*NW*, Aug. 29, page 6).

Third time around for NetView/6000. IBM and Digital Equipment Corp. this week are expected to announce NetView/6000 Version 3.1. The software, which Digital will resell as Polycenter NetView, will support databases from six different vendors and feature enhanced discovery, event management and topology capabilities. The new release, which was expected (*NW*, April 11, page 8), will ship Sept. 16, sources said.

DCE developments. The Open Software Foundation, Inc. (OSF) is getting ready to ship a revised version of its Distributed Computing Environment (DCE) in November, but is already looking forward to the revision after that, slated for late 1995 or early 1996. Possible features of this later version could include better tools for object-oriented development, support for the Simple Network Management Protocol and integration with competing network services from Novell, Inc. and Sun Microsystems, Inc., OSF officials said last week at the DCE Developers Conference.

Attention last-minute filers: This is it—your last chance to get in the running for the User Excellence Awards. Tell us what you've done over the past year to implement innovative networked applications or use networking technology to shave operating budgets. Submit a 250- to 500-word abstract outlining your project by Sept. 12 to the Special Projects Editor via fax at (508) 820-1103 or via E-mail at network@world.std.com.

10th Annual User Excellence Awards

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JOHNSON CONTROLS

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Sprint prepares to offer network access products to its managed nework customers through an alliance with 3Com. *Page 29.*

PREVIEW NETWORLD + INTEROP 94

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FEATURES

Next week: Our annual salary survey reveals what you'll find when managers adjust the compensation mix.

$alary $urvey

Network HELP desk

Network World *tracks down answers to your questions regarding products, services, technologies or disputes with vendors. Please submit questions to Dana Thorat at (800) 622-1108, via fax at (508) 820-1103 or (508) 820-3467, via the Internet at djt@world.std.com or via CompuServe at 73244,2673.*

I have been using Sun Microsystems, Inc.'s PC-NFS to connect to my Sun server. I intend to add a Windows NT server and am concerned about some connectivity issues. First, Windows NT, with built-in TCP/IP, should easily allow users to telnet to the Sun server. Will this be possible from my Windows for Workgroups clients? Also, what do I need to mount the NFS partition on the Sun machine to the Windows NT server?

Fred Berns, Chicago

William Welch, a technical support representative at Corporate Software, Inc., a PC software products, support and systems integration company based in Norwood, Mass., replies:

In order for your Windows for Workgroups clients to connect to a Sun server via telnet or FTP, you will need an additional product, such as FTP Software, Inc.'s PC/TCP Network Software for DOS/Windows or NetManage, Inc.'s ChameleonNFS. These products will enable the client to mount the NFS volumes on the Windows for Workgroups machines, allowing Windows for Workgroups clients and the Sun server to share files. Pricing for PC/TCP starts at $350 for a single-user license. Prices for ChameleonNFS start at $495 for a single user. For more product information, call FTP Software at (800) 282-4387 or NetManage at (408) 973-7171.

If you are planning to mount the NFS partition on the Windows NT server and then share it with your workstations, NetManage's Chameleon32NFS is the only solution I know of for the Windows NT server. Pricing for Chameleon32NFS starts at $695 for a single user.

Also, in order for you to transfer mail to the Unix box and then on to the Internet, you will need a mail gateway package. First, you must upgrade your post office to a full copy of Microsoft Mail. To upgrade the post office, you will need Postoffice Upgrade for Microsoft Windows for Workgroups, which costs $243. You will also need Microsoft Mail SMTP Gateway, which costs $5,000. For more information on

See **Help desk,** *page 54*

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IBM splash will include cut-rate routers, new FEP

BY MICHAEL COONEY

Raleigh, N.C.

IBM this week may set off a price war in the internetwork market with new routers that could be priced thousands of dollars less than competing products.

What's more, according to analysts and users briefed by the company, IBM will announce some major new building blocks for multiprotocol backbone nets. It will unveil a stand-alone version of its 3746 Model 900 front-end processor that supports LAN, Asynchronous Transfer Mode and Advanced Peer-to-Peer Networking traffic, and new 3746-900 LAN interface cards that promise a 70% performance boost.

The company will also roll out a Simple Network Management Protocol Management Information Base (MIB) for the 3745 that will let users manage multiprotocol traffic crossing a Systems Network Architecture net from any standard management platform.

In addition, IBM is expected to announce a new version of its AIX Router and Bridge Manager/6000 program, which will let users monitor Network Basic I/O System or Logical Link Control 2 traffic passing through the router. Today, the package only acts on TCP/IP.

"IBM has some highly aggressive plans, especially in the router area," according to Anura Guruge, an independent analyst based in New Ipswich, N.H.

IBM officials said the new low-end routers — dubbed Remote Network Processors — being codeveloped with Proteon, Inc. will sell for less than $2,000. Similar branch office devices from heavy hitters such as Cisco Systems, Inc. cost more than $3,000.

IBM was not talking, but sources indicated that the company may also lop off as much as $3,000 from its larger routers.

See **IBM routers**, *page 6*

The price of Ethernet switching

Company & product	User ports	Total price	Price per port
SMC TigerSwitch XE	24	$9,450	$394
Cisco Systems, Inc. Catalyst	8	$9,600-$11,600	$1,200-$1,449
Grand Junction Networks, Inc. FastSwitch 10/100	25	$7,950	$298*
Kalpana, Inc. EtherSwitch EPS-2015 RS	15	$7,500-$8,500	$500-$567
Network Peripherals, Inc. EIFO Switch	12	$7,495-$8,995	$624-$749
NetWorth, Inc. PowerPipes	12	$7,495-$8,995	$624-$749
PlainTree Systems, Inc. WaveSwitch 100	16	$9,500-$13,390	$594-$837
SynOptics Communications, Inc. LattisSwitch 28015	16	$8,995	$562

* Only supports one MAC address per port.

GRAPHIC BY TERRI MITCHELL

SMC lets out a roar with LAN switch entry

BY SKIP MacASKILL

Hauppauge, N.Y.

Standard Microsystems Corp. (SMC) next week is expected to enter the workgroup switching market with a roar when it unveils the TigerSwitch XE — an Ethernet switch priced more than 20% below the closest competing product.

TigerSwitch, which will be announced at the NetWorld+Interop trade show as part of a larger architecture announcement from SMC, will provide two to three times the port density of other switches, but at a per-port price of less than $400 (see graphic).

"If SMC's product debuts at that price, it could start a chain reaction," according to Fred McClimans, principal at Decisis, Inc., a consultancy in Herndon, Va. "The Ethernet workgroup switch market is becoming crowded, but there's no one blowing away the competition on price — and that's a key area for users."

SMC declined to comment on the announcement. But according to sources close to the company, TigerSwitch is a 24-port Ethernet switch that is designed to interconnect 10Base-T workgroups and provide dedicated links to mission-critical resources such as file servers.

The switch, an optimized version of SMC's high-end EliteSwitch (ES)/1 intelligent switching hub, is based on a dual-Reduced Instruction Set Computing (RISC) architecture that provides high throughput and a nonblocking fabric that will support 12 simultaneous

See LAN switching, *page 13*

PREVIEW

NETWORLD + INTEROP 94 +

Government demos ATM's role in disaster relief

BY JOANIE WEXLER

San Diego

Score one for ATM in the multivendor switch connectivity column.

In a disaster relief test demonstration being conducted over a nationwide Asynchronous Transfer Mode network by a division of the U.S. Armed Forces, ATM switches from SynOptics Communications, Inc., Fore Systems, Inc. and GTE Government Systems Corp. linked by Sprint Corp. 45M bit/sec ATM services are interoperating with minimal headaches, according to several project participants.

The demo — a test of how government could one day use ATM to save lives in disaster situations — showed that configuring the various switches "is still not for the novice," said one participant. Also, speed gains with ATM technology could be more impressive, and interoperability work needs to be done among adapter card vendors.

But from a basic switch interoperability standpoint, the project has been a success, according to participants.

The demonstration by the Naval Command, Control and Ocean Surveillance Center's Research and Development Division (NRAD) leverages ATM in a way that could save lives in times of war and natural disasters by bringing together all four divisions of the armed forces and relief agencies, said John Switlik, an NRAD project engineer.

ATM will soon help in tracking disasters such as Hurricane Emily, seen above.

The military-developed application allows people in dispersed geographic areas to work together on logistics, transportation, supplies management, battle planning and weather disasters. It mixes images and photography from satellites housed at the Earth Resources Observation Systems (EROS) data center in Sioux Falls, S.D., with whiteboarding, videoconferencing and other collaborative electronic tasks.

The ATM demo slashed to eight minutes the time to transmit 100M-byte images among the three partici-

See **ATM demo**, *page 20*

PictureTel brings video to the LAN

BY ELLEN MESSMER

Danvers, Mass.

PictureTel Corp. this week will introduce LiveLAN, a software-based system that lets PC users conduct point-to-point videoconferences across NetWare-based token-ring and Ethernet LANs.

The company will also deliver software dubbed LiveManager that helps video coexist with other traffic on a LAN by diminishing the bandwidth required for video when data traffic increases.

LiveLAN will only support LAN-based videoconferencing until mid-1995, when PictureTel will release a gateway called the Live transcoder. The gateway will convert the proprietary LiveLAN algorithm to the H.320 standard that works over ISDN lines, enabling the system to reach across the wide area.

"[LiveLAN] can't get from the LAN to the WAN yet since there are no standards for the LAN yet," said Tony Paradiso, director of marketing for PictureTel's personal systems division.

PictureTel has determined that LAN-based video is ill-suited for H.320, Paradiso said, so a transcoder is being developed to handle the LAN-to-H.320 translation. But the transcoder, not yet priced, will not ship until mid-1995.

LiveLAN, an entirely software-based coder/decoder system, requires a Windows-based 486 PC with at least 15M of available hard-disk space and a VGA or higher resolution monitor. The PC must be on a network supporting Novell, Inc. NetWare 3.1 or higher, and must have an audio capture card and a

See **PictureTel**, *page 69*

CORRECTION

A chart with our ATM switch test (Aug. 22) incorrectly stated that the point-to-multipoint capability of Fore Systems, Inc.'s ASX-200 failed to work. The problem was encountered with another switch, as accurately reported in the test story. We're running the corrected chart to clarify the situation.

Product	**ASX-200**	**APEX DV-2**	**SPANet 155**	**36150 MainStreet**
Key findings	▶ Suitable for workgroup and backbone applications. ▶ Posted the lowest delay times for OC-3 interfaces. ▶ Provides bandwidth policing.	▶ Targeted at backbone applications. ▶ Has redundant load sharing power supplies. ▶ Provides bandwidth policing. ▶ A bug prevented the switch from handling more than a 21% aggregate switch load.	▶ Designed for large backbone and central office applications. ▶ Does not offer bandwidth policing. ▶ Rated for harsh environments. ▶ Can be configured with multiple levels of redundancy.	▶ The easiest switch to set up and configure. ▶ Rated for harsh environments. ▶ Does not offer bandwidth policing. ▶ Point-to-multipoint capability did not work in our test environment.
Vendor	Fore Systems, Inc. 174 Thorn Hill Rd. Warrendale, Pa. 15086-7536 (412) 772-6600	General DataComm, Inc. 1579 Straits Turnpike P.O. Box 1299 Middlebury, Conn. 06762-1299 (203) 574-1118	GTE Government Systems Corp. 77 A St. Needham, Mass. 02194-2892 (800) 982-0381	Newbridge Networks, Inc. 593 Herndon Parkway Herndon, Va. 22070-5241 (703) 834-3600

Also, the incorrect division of Fujitsu was credited with making the SMX-6000 Service multiplexer mentioned in the same article. The SMX-6000 Service multiplexer is made by Fujitsu Network Switches of America. We regret these errors.

Here's A List Of All The Companies That Can Solve All Of Your Low-End Internetworking Problems.

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Stop by booth 524 at NetWorld+Interop.

IBM to buy up key piece of broad middleware plan

BY KEVIN FOGARTY AND JOANIE WEXLER

Hursley Park, England

IBM is expected to announce next week that it has acquired the rights to Apertus Technologies, Inc.'s ezBridge middleware, which is the core of IBM's message-oriented middleware product, MQSeries.

The acquisition is a signal to customers that message-oriented middleware will become a major part of IBM's networking blueprint for the future.

IBM is also reportedly negotiating with telecommunications giants AT&T and MCI Communications Corp. to use MQSeries to help beef up the international segment of the Advantis value-added network (VAN), a joint venture between IBM and Sears, Roebuck and Co. MQSeries would run on the public net as a way to link disparate networks.

The move dovetails with the ezBridge acquisition, users and analysts said. "IBM will use these products to answer any accusation that they don't do open platforms," said Wayne Williams, manager of software services at the Colonial Williamsburg Foundation in Williamsburg, Va. The foundation uses MQSeries products to link ticketing and billing applications running on AIX and OS/400.

Message-oriented middleware such as the MQSeries acts like electronic mail on steroids, delivering messages between applications across many platforms. The messages can be data or activity calls, so the MQSeries can act as a database replication vehicle, deliver queries to a database or deliver procedure calls to launch activities in an application.

IBM has been reselling ezBridge as part of its MQSeries while it develops a new generation of the products using its own code, MVS and Application System/400 versions of which are available, said Steve Craggs, senior manager for MQSeries business.

Terms of the deal were settled weeks ago, but the two companies were still wrangling last week over the wording of the announcement. "[We] bought all of it — the code and the copyrights," one IBM official said, adding that ezBridge will be rolled into the IBM product and its name changed later this year.

IBM also has a number of moves planned to raise MQSeries' profile.

- IBM's FlowMark workflow product will be able to use MQSeries communications code, eliminating the need for its own communications facility and simplifying Flowmark application development.
- MQSeries will integrate with IBM's System Object Model/Distributed System Object Model technology to let objects talk to each other asynchronously, said Don DePalma analyst at of Forrester Research, Inc.

It will be a resource manager under CICS, too.

- The ability to trigger an IMStransaction from a client/server system will be added to MQSeries by the first quarter of 1995, Craggs said.
- IBM will add communications code to MQSeries that is based on similar functions in CICS. Currently, MQSeries rides on top of CICS, so users have to buy CICS to use MQSeries.

Craggs also confirmed that IBM plans to run MQSeries on its Advantis VAN and is negotiating with international carriers to put it on their nets, as well.

The link would strengthen Advantis' reach in the U.S. and especially in Europe, where it is limited by local carrier bandwidth and feature constraints.

The all-IBM version of MQSeries (does not include ezBridge code) features:

- ◆ 10 layers of priority queuing.
- ◆ Ability to batch messages for faster throughput.
- ◆ Triggers to launch processes in other applications.
- ◆ Ability to store queues in memory rather than on disk to increase transfer speed.

IBM routers

Continued from page 4

"The prices IBM has promised to deliver on these new routers could be mind-blowing for some of the other vendors," Guruge said. "IBM has little to lose and a lot to gain by being the price leader."

IBM detailed technical plans for its new routers at last month's Share, Inc. user conference (*NW,* Aug. 15, page 1).

The company first hinted that a stand-alone version of the 3746 was in the works at the spring NetWorld+Interop conference recently (*NW,* May 9, page 1).

IBM introduced the 3746-900 in 1992 as an expansion option for the venerable 3745 line.

The 3746 runs proprietary software that will switch incoming Token-Ring, Ethernet and APPN traffic among its 16 ports.

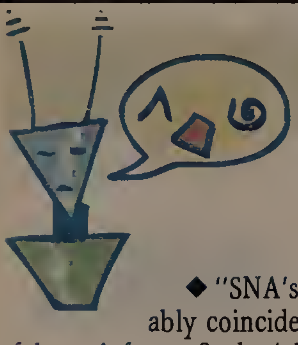
The box will also support an Enterprise System Connectivity channel to the mainframe, as well as frame relay and ATM interfaces.

The new stand-alone version will be placed under IBM's ATM product line, Nways, and will be dubbed the Nways 3746 Controller.

"As we move away from 3270 terminals and 3174 controllers and onto PCs and LANs, we can wean the 3746s from the 3745s while allowing uninterrupted mainframe access for users," according to James Harrington, director of WAN engineering for the Office of Telecommunications with the Social Security Administration based in Baltimore.

As for the original 3745, sources said IBM will add an SNMP MIB to the box's Network Control Program.

"So much TCP/IP is running through IBM mainframes now that host-based NetView can't control, that IBM wants to let users manage it from a separate SNMP-based manager," Guruge said.



CyberSpeak: *Voices from the reader network*

Will SNA ever die?

◆ "SNA's death will probably coincide with the death of the mainframe. So don't hold your breath or you may not be around to see it."

Andy Jezierski, group leader for systems programming, Stephan Co., Northfield, Ill.

◆ "The computer landscape is littered with the dead and dying carcasses of people, companies, products and protocols. Who'da thunk, in 1979, that CP/M would be dead in two or three years or that WordStar would ever be replaced as the PC word processor of choice. The list goes on. Someday, even Microsoft will join the pile of dead bodies.

"SNA will also die. It will be replaced because a new protocol will evolve that does an even better job. On the other hand, if SNA is a concept rather than a product, it will evolve into the latest and greatest SNA. In any case, SNA, as defined today, will surely go away."

Dave Johnson, regional information resources manager, U.S. Department of Labor, Kansas City, Mo.

◆ "For the last 20 years, SNA has been the communications backbone of business enterprises worldwide and the primary protocol for transporting business-critical data. SNA continues to be an important element, but the challenge it faces in the future is that as corporate networks grow, they are growing into mixed environments of SNA, TCP/IP and LAN protocols. The trend in these mixed environments is that TCP/IP and LAN are gaining a greater share of the market.

"However, with the investments companies have in SNA, it will remain mission-critical."

John Burton, president and chief executive officer, LEGENT Corp., Herndon, Va.

NextWeek CyberSpeak Out!

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Network overload hobbles SprintLink

BY ELLEN MESSMER AND JOANIE WEXLER

Atlanta

A victim of its own success in the Internet market, Sprint Corp. is struggling to alleviate traffic jams in its SprintLink TCP/IP network amid customer complaints about severe net slowdowns.

At next week's NetWorld+Interop show here, Sprint will announce an expansion plan for SprintLink that is aimed at relieving the congestion. The carrier plans to add more T-3 lines and upgrade the Cisco Systems, Inc. T-3 routers used in the network.

Sprint, which today operates a T-3 Internet backbone stretching from Washington, D.C. to Stockton, Calif., with T-1 links into several cities, began selling Internet access just over a year ago.

"We're facing incredible growth," said Bob Doyle, SprintLink product manager. "We're getting orders at the rate of three to four times what we [expected]."

SprintLink traffic has jumped from 5 terabytes per month in January to 30 terabytes now. Large file transfers and use of the bandwidth-consuming Mosaic graphical user interface are also on the rise, said Sprint's Theresa Shanahan.

The congestion has hit customers with direct SprintLink connections or using reseller services. "I'm experiencing dropped packets, and the delay times are horrible," said one user.

To compound the net woes, a few weeks ago, Sprint's T-3 router in Stockton completely blew out and the backup T-1 link was swamped. Sprint has since replaced the T-3 router.

Doyle acknowledged that inadequate capacity has brought unacceptable delays in electronic mail delivery and telnet functions.

By year end, Sprint will boost line speed along several routes from T-1 and 56K bit/sec to T-3 and add several new T-3 nodes nationwide. "Eight out of 12 major backbone links, including Chicago, New York, Seattle and Atlanta, will have T-3," Doyle said. "The congestion today is on the T-1 circuits."

The central connectivity point for more than 60 commercial Internet providers, the Commercial Internet Exchange (CIX) router in California, has also become a choke point for delays, Doyle pointed out.

However, late last month, CIX members upgraded the backbone links between their services to broadband Switched Multimegabit Data Services links (*NW,* August 29, page 28).

And at a separate East Coast connection point shared by Internet providers Sprint, Performance Systems International, Inc. and UUNET Technology, Inc., there's discussion about upgrading the 10M bit/sec Ethernet service to 100M bit/sec.

COMPUSERVE JOINS THE CLUB

The moves can't come any too soon, as more service providers are continually jumping into the Internet access game.

Last week, for instance, CompuServe said it will offer commercial customers dedicated Internet access through its frame relay and X.25 services and dial-up access via the point-to-point protocol at speeds of 14.4K bit/sec in November.

CompuServe, a new CIX member, is also testing 28.8K bit/sec and ISDN dial-up access. The company would say only that its services would be priced competitively with existing providers. SprintLink for instance, costs $2,700 per month or $32,400 per year for T-1 access.

CompuServe has also signed a letter of intent with an unnamed company to develop World Wide Web (WWW) services, said Greg Moore, a CompuServe director of marketing.

CompuServe said it will provide access to WWW and Gopher servers in the first half of 1995.

Digital Link intros high-capacity ATM access device

BY MICHAEL CSENGER

Sunnyvale, Calif.

Digital Link Corp. next week will unveil its W/ATM GateWay, an Asynchronous Transfer Mode access multiplexer that concentrates multiple types of user traffic over wide-area ATM links.

The GateWay can be used in very large private networks as an ATM access device, or by carriers as a feeder node. GateWay joins Digital Link's W/ATM PremisWay, announced last February, which serves a similar function on a smaller scale.

According to Digital Link product literature, which the company confirmed was accurate, both products multiplex data, voice and video traffic over single or multiple ATM links. They handle cell conversion for frame-based traffic, with prioritization and cell buffers for traffic management.

The initial GateWay release has a 250M bit/sec backplane that supports local switching among user ports, but not wide-area switching.

Built around two subsystems, only the first of which is being introduced at NetWorld+Interop, GateWay is a modular, scalable product. The Access 1 SubSystem concentrates 56/64K and 1.5M bit/sec lines over 45M bit/sec ATM or Switched Multimegabit Data Switch links.

On the user side, it supports SMDS, full and fractional T-1 circuit emulation, frame relay and ATM user-to-network interfaces.

Wide-area network interface cards hold two T-3 ports each, and two network cards can be installed on each shelf.

Multiple shelves can be connected together for greater port density, as in carrier environments. Each shelf has nine slots for user interface cards, with four T-1 ports per card. Total user capacity for the Access 1 SubSystem is 100 T-1 ports.

When it is released later next year, the Access 2 SubSystem will support higher speed user and network interfaces. User interfaces include T-3 SMDS and ATM, V.35 and High Speed Serial Interfaces, MPEG1/2 and T-3 circuit emulation. These user inputs would be concentrated over T-3 SMDS and ATM, or OC-3 ATM services.

Ron Jeffries, principal at Jeffries Research, Inc. in Santa Maria, Calif., said it is early in the ATM game, "but as things heat up, we'll see that this kind of concentrator makes sense."

The W/ATM GateWay Access 1 SubSystem will enter beta testing during the fourth quarter and will ship early next year. A fully loaded shelf will cost about $170,000.

©Digital Link: (408) 745-6200.

Vendors unite in support of low-speed ATM

BY PEGGY WATT

San Francisco

A group of Asynchronous Transfer Mode product developers is organizing to promote 25M bit/sec ATM technology by setting standards and defining interoperability tests.

The Desktop ATM25 Alliance, being launched this week by about 25 charter members, plans to refine a specification for 25M bit/sec ATM to the desktop that was originally submitted last year to the ATM Forum. The forum, which has nearly 600 members, including about 100 user companies, has chosen to focus first on a 51M bit/sec ATM spec instead.

The alliance has been spearheaded by IBM and desktop ATM start-up Whitetree Network Technologies, Inc. of Palo Alto, Calif. Other members include Chipcom Corp., First Virtual Corp. and Madge Networks, Inc.

IBM's 25M-bit ATM adapter for DOS and Windows computers, dubbed TurboWays 25ATM Adapter, is the only 25M bit/sec product now shipping, but many other vendors have products in the works.

"The short-term goal is to refine the spec and to get the ATM Forum to ratify it within a year," said Maureen Lawrence, chief executive officer at Whitetree, which plans to unveil its product strategy next month.

Longer term, the group will give the ATM Forum recommendations for interoperability testing, said Jim Glekas, ATM program manager at IBM in Raleigh, N.C.

The Desktop ATM25 Alliance will submit its specification to the ATM Forum's technical committee, which has already approved a standard for 155M bit/sec ATM over twisted pair. The alliance will also rely on the forum for user input regarding the specification.

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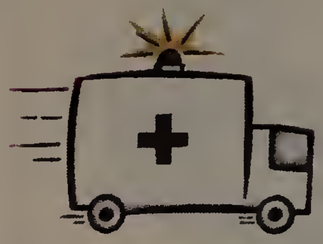

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DCA takes aim at Microsoft Hermes with NetWizard

BY JIM DUFFY

Alpharetta, Ga.

Digital Communications Associates, Inc. last week entered the software distribution and management fray with a product company officials said will compete with Microsoft Corp.'s Hermes.

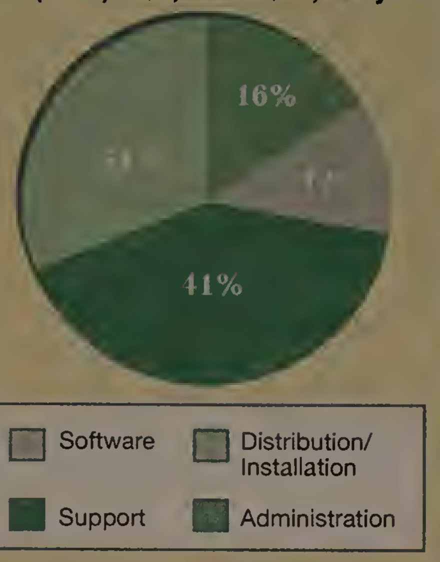
DCA's NetWizard is designed to let network administrators install, configure and monitor software on an unlimited number of networked Windows and DOS personal computers from a central Windows-based console. NetWizard works over LANs and WANs, eliminating the need for users to perform software maintenance at every node on site, DCA officials said.

BRANCHING OUT

The move into software distribution is one of several efforts made this summer by DCA, a longtime micro-to-mainframe product leader, to branch out. The company has jumped into the groupware (*NW*, Aug. 1, page 25) and middleware (*NW*, Aug. 29, page 36) markets, as well.

Breakdown of software costs per PC

Total (1993) = $8,000 to $13,000/year



SOURCE: GARTNER GROUP, INC., STAMFORD, CONN.
GRAPHIC BY TERRI MITCHELL

NetWizard's introduction was welcomed by users.

"I'm a network manager with 1,700 PCs out there," said Paul Jones, director of networking and microcomputer services at Pensacola Junior College in Pensacola, Fla. "I just need to be able to get to these machines without having to put on the sneakers and run out there, and be able to copy software easily from one machine to another."

The product works under a central manager-to-remote agent scheme. Branch Distribution Agent software resides on the managed PCs, serving as distribution repositories and information collection points for the NetWizard console.

Network managers can communicate directly with the agents via NetWizard, eliminating the need to even log on to file servers in the field.

The agents allow NetWizard operators to browse and edit any file on any managed node so they can update or delete files when software on the node has been updated.

NetWizard also includes a feature called Distribution Undo that allows network administrators to uninstall an update or change across the network via a drag-and-drop operation.

A feature called Transaction Processing allows NetWizard users to group multiple operations into logical transactions, automatically recover failed transactions and restore updated or deleted files.

Net managers can store information collected by NetWizard in any database that conforms to Microsoft's Open Database Connectivity specification.

DCA officials said NetWizard will take on Microsoft's Systems Management Server product, which is widely known by its code name Hermes.

The Microsoft offering, expected to ship this month, also performs software distribution and inventory management on networked PCs, but must run on a Windows NT Advanced Server platform.

DCA's product will also go up against Intel Corp.'s LANdesk Manager and Saber Software Corp.'s LAN Workstation Manager.

According to Fred McClimans, principal at the Decisis, Inc. consultancy in Herndon, Va., the DCA product can compete with other offerings from a feature perspective, but it may not have the sales and marketing muscle needed.

NetWizard costs $595 for a 10-node license. It is available now.

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Xyplex to unveil new line of low-end Ethernet routers

BY SKIP MACASKILL

Littleton, Mass.

Xyplex, Inc. next week will announce a new set of remote site routers, including two models that combine hub and routing functionality.

The Network 3000 series, which will debut at the NetWorld+Interop trade show, comprises five devices that will allow net managers to extend the reach of their enterprise networks to distant Ethernet LANs.

The five models include:

- The **Network 3400 Router,** which comes with a single Ethernet Interface and one wide-area network connection that can be either frame relay or a leased-line connection operating at T-1 (1.544M bit/sec) speed. Available next month, it costs $1,995.
- The **Network 3410 Router,** which offers a single Ethernet interface and an integrated ISDN Basic Rate Interface port. It is geared to telecommuters or small remote offices that need a high-speed dial-up connection to a corporate LAN. Priced at $2,195, the 3410 is available next month.
- The **Network 3500 Router,** which features the same capabilities as the 3400 but offers an additional WAN port that can be configured as a second link back to the corporate network or as a backup connection. It will be available in October for $2,295.
- The **Network 3800 Routing Hub,** which boasts a single Ethernet interface, one WAN port and an integrated 12-port 10Base-T hub. It costs $2,995 and will ship next month.
- The **Network 3850 Routing Hub,** which adds an additional WAN port to the 3800. It will also be available in October and cost $3,295.

The devices come standard with support for the IP, IPX and AppleTalk network protocols. DECnet and Open Systems Interconnection protocol support are optional.

The Routing Information Protocol, Open Shortest Path First and Multicast OSPF routing protocols, and the Spanning Tree bridging algorithm are also supported. Bandwidth management features include dial-on-demand, leased-line backup, inverse multiplexing, time-of-day routing and 2-to-1 data compression.

Charlie Robbins, vice president of communications research at Aberdeen Group, Inc., a Boston-based consultancy, said the 3000 series plays to remote office networking strengths of Xyplex, already a leader in the terminal server market.

"The company lost a lot of marching time when it went after the high-end market with its 9000 routing hub," Robbins said. "But the 3000 is a natural for its sales channels, and it has the proven technology, so it should do well in this space."

©Xyplex: (508) 264-9900.

Reality ✓ Check

Product: Network 3000
Company: Xyplex, Inc.

The benefits:
- Hub and router functionality in a single device (Models 3800, 3850).
- Integrated ISDN features.
- Aggressive pricing.

The drawback:
- Chip upgrade cannot be done in the field.

The analyst view:
"Xyplex has kept it simple, made it flexible and priced it correctly."

Charlie Robbins

Oracle opens the gate to mainframe database access

BY BARB COLE

Redwood Shores, Calif.

Oracle Corp. last week said that it will develop a gateway that will give Oracle users direct access to a variety of mainframe databases not currently accessible through Oracle middleware.

Oracle Gateway for Enterprise Data Access (EDA)/SQL, which will be available in the first quarter of 1995, will give users direct access to mainframe data sources, such as ISAM, VSAM and Adabas. Oracle will jointly develop the gateway with Information Builders, Inc. (IBI), makers of EDA/SQL middleware.

Oracle's existing Transparent Gateway, which works only with IBM's DB/2, uses remote procedure calls and requires users to write custom code and set up separate servers to handle mainframe transactions. Oracle Gateway for EDA/SQL will not require custom coding and users will not have to off-load transactions to separate machines, the firm said.

In addition, end users will not need to know

See Oracle, *page 13*

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SNA VIEWS

"In 20 years, or maybe sooner, [SNA] will occupy only a corner of the enterprise network — a very large corner, but a corner nevertheless."

John Chapman

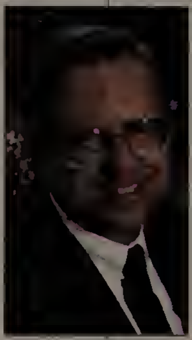
◆ ◆ ◆

"SNA...has one of the most extensive architectures ever designed. IBM is strong in developing migration paths from one generation of technology to the other, and there's no reason to think it won't continue that tradition with SNA."

John Hunter

◆ ◆ ◆

"If you're an SNA user, there is no need to dump it because the combination of IBM's Broadband Network Services [ATM] architecture and SNA will ensure SNA's viability for many years to come."



Gary Weis

◆ ◆ ◆

"IBM's greatest challenge is to integrate multiprotocol support into SNA — SNA will live or die by how well IBM does that."

James Harrington, director of WAN engineering for the Office of Telecommunications in the Social Security Administration

◆ ◆ ◆

"If [IBM] doesn't do something to compete with TCP/IP, then it will just accelerate the decline [of SNA] because people want to get more open."

Dewaine Osman, vice president of corporate planning and business development, Unisys Corp.

SNA

Continued from page 1

a 30th birthday for SNA.

In its first 10 years of development, SNA technology evolved slowly and without much competition. Along the way, it developed very loyal followers.

"It's pure delusion to think large corporate networks will give up SNA anytime soon," said Thomas Wirth, director of communications and information systems for Swissair's North American network. "It will take another five years for TCP/IP to have the maturity and stability of SNA. The tools and functionality for running a large network just aren't available yet."

SNA — turns — 20

Stability is of paramount importance to the state of Illinois, where SNA will remain the backbone technology, said Ron Sanderson, manager of net software and support for the Illinois Bureau of Communications and Computer Sciences' Information Services division (see story, page 13).

But the yellow brick road many SNA users were following has turned into rush hour in New York where competing technologies approach at every intersection and issues like supporting multiprotocol traffic clog major arteries.

John Chapman, president of the IBM user group Share and a net administrator with Amoco Corp., said users need more than SNA can offer. Two years ago, Amoco's backbone ran almost 100% SNA, but today, SNA makes up less than 50% of the traffic. "We needed more styles of interconnection than SNA could provide," he said.

John McGinness, MIS director for Henkel Corp.'s Functional Products Group in Kankakee, Ill., said IBM needs to improve the integration of LANs and SNA. "We're moving to a client/server environment that includes a mainframe, AS/400s and LANs," he said. "Making that work should be a priority for IBM since a lot of users are doing this."

APPN should be the natural evolution for SNA users such as Henkel. Its peer capabilities remove the hierarchical constraints of SNA and promise more flexible networking. But IBM has to get over some hurdles if it wants to see SNA/APPN thrive — not the least of which is cost.

"If you look at the cost per node of doing APPN on a workstation, it's very expensive," said Robert Moskowitz, a technical support specialist with Chrysler Corp.

Said Swissair's Wirth, "It's not cheap, but I wouldn't replace it with anything for at least five to eight years because nothing else is as mature yet."

Users said IBM must also give APPN better security to safeguard their nets. "It's unclear how we'll keep users in one part of the state from accessing other nets," Sanderson said.

IBM's ace in the hole is High Performance Routing (HPR), which promises to eliminate the biggest inefficiencies in APPN. HPR can route around failures and improves prioritization while increasing performance by more than 30%.

"There is nothing I want more right now than HPR," Sanderson said. "It will give us the reliability of our existing hierarchical SNA net."

George Wallner, chief technologist for Hypercom Corp., added, "HPR carries with it the promise of SNA networking in the 21st century."

But HPR has been delayed, and many analysts said the longer IBM waits to get it out the door, the wider TCP/IP's influence expands in SNA shops. (IBM said HPR products should begin appearing in early 1995.)

"There will be a slow bleeding away of SNA users if IBM doesn't get HPR implemented soon," said Thomas Nolle, president of the CIMI Corp. consultancy in Voorhees, N.J.

"We're actively experimenting with APPN, but we haven't jumped into it [because] we feel that whatever protocol we move to should be an open protocol," said Dave Bittenbender, chief of telecommunications at the Environmental Protection Agency. "I'm not convinced that APPN is an open standard."

Added Joe Mohen, chief technology officer with Proginet Corp., an independent software developer based in Uniondale, N.Y., "It's probably already too late for APPN to beat out TCP/IP. That's not to diminish APPN because it works. But APPN will likely be routed over TCP/IP backbones and not the reverse."

IBM, for its part, has tried to provide a smooth migration path for SNA users to move to APPN but has been slow to the task in some cases. "If IBM had spent more time getting APPC and APPN applications out the door a couple years ago, there would have been a ready-made market," Nolle said. "Now IBM has to fight to get some of those customers back who got tired of waiting."

In the end, will SNA survive? That depends.

If IBM can keep mainframes around, SNA/APPN will be there, Nolle said. If not — and it's not clear yet whether IBM will be successful — SNA will only be in a fraction of its former accounts.

Anura Guruge, an independent analyst based in New Ipswich, N.H., adds, "If IBM cannot retain at least half its current installed SNA base as it moves to APPN, then it and SNA will become an endangered species very quickly."

According to Gary Weis, president and chief operating officer for Advantis, a value-added network provider formed by IBM and Sears, Roebuck and Co., "SNA will survive, but it is no longer the only game in town."

"SNA isn't going to disappear, but it will play a diminished role," Amoco's Chapman agreed.

Added John Hunter, vice president of development and technology at Landmark Systems Corp. and former IBM director of communications, "The pendulum that swung away from the mainframe and SNA in the past few years is swinging back. SNA and APPN are sophisticated enough to survive for at least 10 more years. Beyond that, it's not clear."

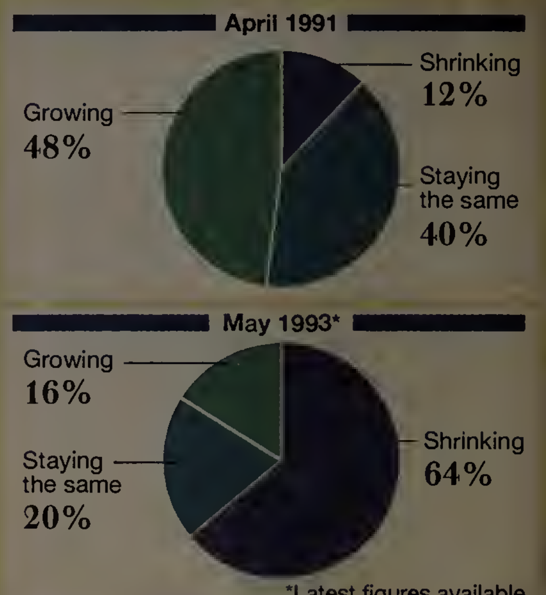
Weis, who ran Sears' massive SNA net before it was integrated into Advantis, said, "IBM's greatest challenge is to take away any reason a user would have to move from SNA to another technology."

"It would be a loftier goal to get SNA and TCP/IP to interoperate so that it didn't matter what the user wanted to run," said James Gray, an IBM Fellow and manager of SNA studies. "Removing barriers to communicate across enterprises is the ultimate goal, and if SNA can do that, it'll be around for quite a while."

Senior Writer Michael Csenger and Senior Washington Correspondent Ellen Messmer contributed to this story.

Withering SNA

Is your SNA net growing, shrinking or staying the same size?



*Latest figures available

Survey of 50 of the nation's largest 1,000 corporations.

SOURCE: FORRESTER RESEARCH, INC. CAMBRIDGE, MASS.
GRAPHIC BY SUSAN SLATER

SNA application trivia

$20 trillion has been invested in SNA applications worldwide.

65% of existing applications will be around 10 years from now.

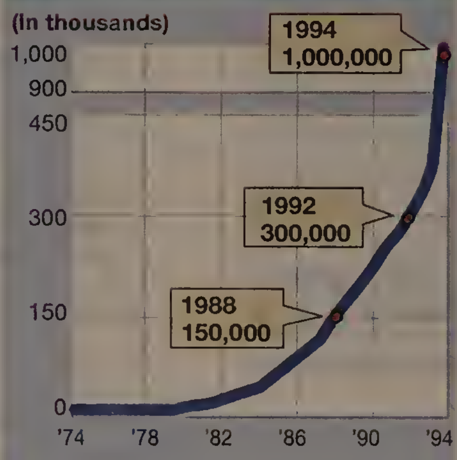
7% of mainframe shops will convert applications off mainframes in the next 10 years.

30% of mainframe shops will be using APPC by the end of 1995.

From a survey of 600 mainframe users worldwide.

SOURCE: XEPHON PLC, BERKSHIRE, ENGLAND

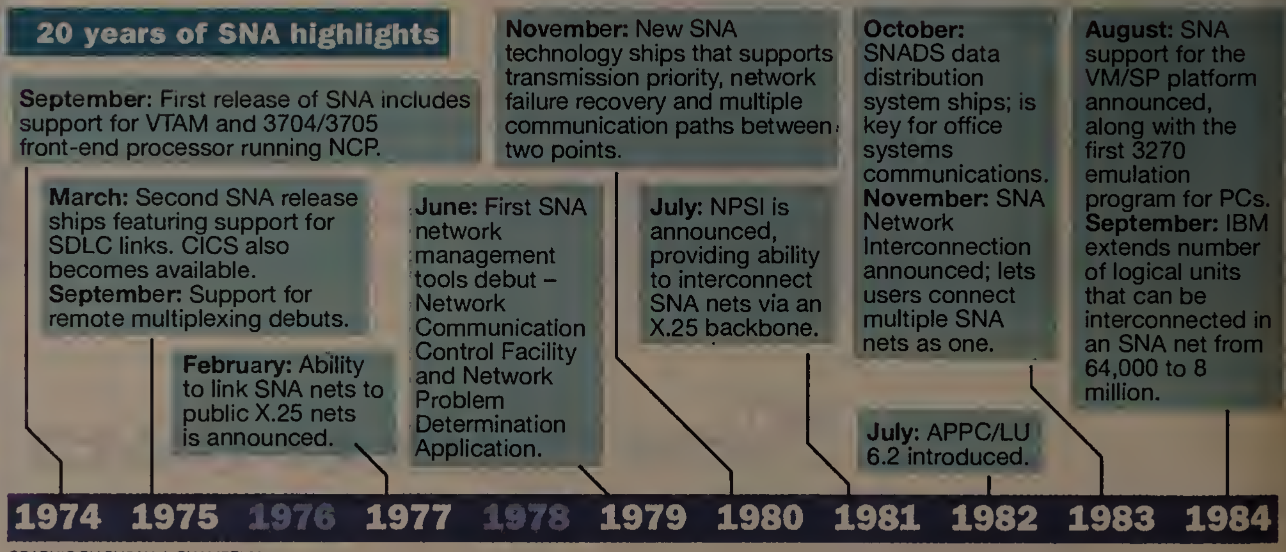
Worldwide shipments of IBM SNA control points



Control points manage the resources of SNA nodes. Until 1987, only VTAM included a control point, but later they were included in System/36 and AS/400 minicomputers, as well as other APPN-related devices.

SOURCE: IBM, RALEIGH, N.C.

20 years of SNA highlights



September: First release of SNA includes support for VTAM and 3704/3705 front-end processor running NCP.

March: Second SNA release ships featuring support for SDLC links. CICS also becomes available. **September:** Support for remote multiplexing debuts.

February: Ability to link SNA nets to public X.25 nets is announced.

June: First SNA network management tools debut – Network Communication Control Facility and Network Problem Determination Application.

November: New SNA technology ships that supports transmission priority, network failure recovery and multiple communication paths between two points.

July: NPSI is announced, providing ability to interconnect SNA nets via an X.25 backbone.

July: APPC/LU 6.2 introduced.

October: SNADS data distribution system ships; is key for office systems communications. **November:** SNA Network Interconnection announced; lets users connect multiple SNA nets as one.

August: SNA support for the VM/SP platform announced, along with the first 3270 emulation program for PCs. **September:** IBM extends number of logical units that can be interconnected in an SNA net from 64,000 to 8 million.

GRAPHIC BY SUSAN J. CHAMPENEY

Illinois is moving on with SNA

BY MICHAEL COONEY

Springfield, Ill.

If you want to witness the evolution of SNA, take a trip to the heartland.

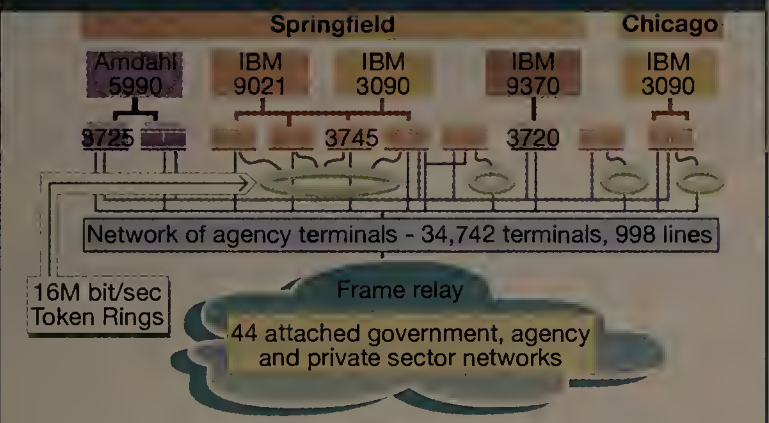
Coming from an environment steeped in the traditional SNA/Synchronous Data Link Control hierarchy, the state of Illinois is poised to exploit technologies including frame relay and Advanced Peer-to-Peer Networking that will change the face of SNA forever.

The state's Bureau of Communications and Computer Sciences (BCCS), like many other large corporate users, has a long-standing relationship with Systems Network Architecture, having formally adopted it as the communications architecture of choice statewide in 1982.

But the winds of change are blowing.

"We feel that SNA is our base, but we want to move to technologies that can enable us to move into client/server and, ultimately, ATM," said Ron Sanderson, manager of network software and support for the BCCS' Information Services division. "We don't want any barriers as we move forward, and we thought traditional SNA/SDLC was beginning to slow us down."

Illinois illustrates SNA evolution


Springfield
Chicago
Amdahl 5990
IBM 9021
IBM 3090
IBM 9370
IBM 3090
3725
3745
3720
Network of agency terminals - 34,742 terminals, 998 lines
16M bit/sec Token Rings
Frame relay
44 attached government, agency and private sector networks

Illinois' state network has evolved from a morass of multidrop lines to a frame relay net in a little over four years. The state plans to deploy APPN later this year.

BCCS provides network services for more than 100 agencies, from the city of Chicago and the Cook County clerk's office to the Illinois State Lottery.

The bureau has five mainframes, all but one of which are tied to 16M bit/sec Token-Ring LANs via seven IBM 3745 front-end processors (FEP). The net supports some 34,000 logical units.

Plenty of 3270 applications are also supported, but most future application development will be based on IBM's Advanced Program-to-Program Communications facilities, Sanderson said.

"The 3270 applications are the No. 1 obstacle to integrating our mainframes into our client/server environment," Sanderson said.

BCCI faces other challenges, as well, such as supporting the myriad protocols that each agency has been given the freedom to employ.

"Those agencies bring non-IBM protocols and increased LAN traffic, which needs to communicate across our backbone," he said.

To make way for that traffic, the agency has built a private frame relay network out of its 3745 FEPs and a beta version of the FEP's Network Control Program Version 7 Release 2 software.

The net includes some 1,000 lines with speeds ranging from 9.6K to 64K bit/sec.

"Frame relay now lets us mix any protocols over any single pipe in the net," Sanderson said. "We eliminated our leased-line costs by going to our own private net, plus we can now offer less-costly links to our other state agencies, saving them money, as well.

"We save at least $500 per month because we no longer need redundant 9.6K bit/sec lines, and we increased throughput by three times," Sanderson said.

Sanderson's biggest concern with the frame relay so far has been error recovery.

"Frame relay isn't as tolerant of errors and dirty lines as SDLC was. So if an error occurs or a device fails at one end of a connection without anyone noticing it, the other end will continue to retransmit until it gets the proper response," Sanderson said. "It can snowball into a big congestion mess at the other end," if not monitored closely.

A new version of NetView Performance Monitor does help the agency track frame relay usage.

"What we need though, is a NetView application that can monitor the frame relay net to see what data is flowing where and to produce some performance reports," Sanderson said.

To aid in transporting the variety of LAN traffic over the SNA/frame relay net, the agency has deployed IBM's RouteXpander/2 and the LAN-to-LAN over Wide Area Network (LLW) products, which he said have handled the job well.

RouteXpander is an OS/2-based router/gateway for branch office locations. It supports frame relay and can feed LAN and SNA traffic to a router or FEP. LLW is an OS/2-based program that lets remote offices send Network Basic I/O System and other LAN-based traffic over an SNA net.

"By installing RouteXpander, we eliminate the need for additional 3174s, saving another $10,000 per site," Sanderson said.

The agency is also looking at deploying Eicon Technology Corp.'s NetWare Router for use in environments that need to route Novell, Inc.'s IPX protocol across the frame relay backbone.

SIGHTS SET ON APPN

As for APPN, the agency this month expects to begin testing VTAM Version 4 Release 2, which delivers APPN support to the mainframe.

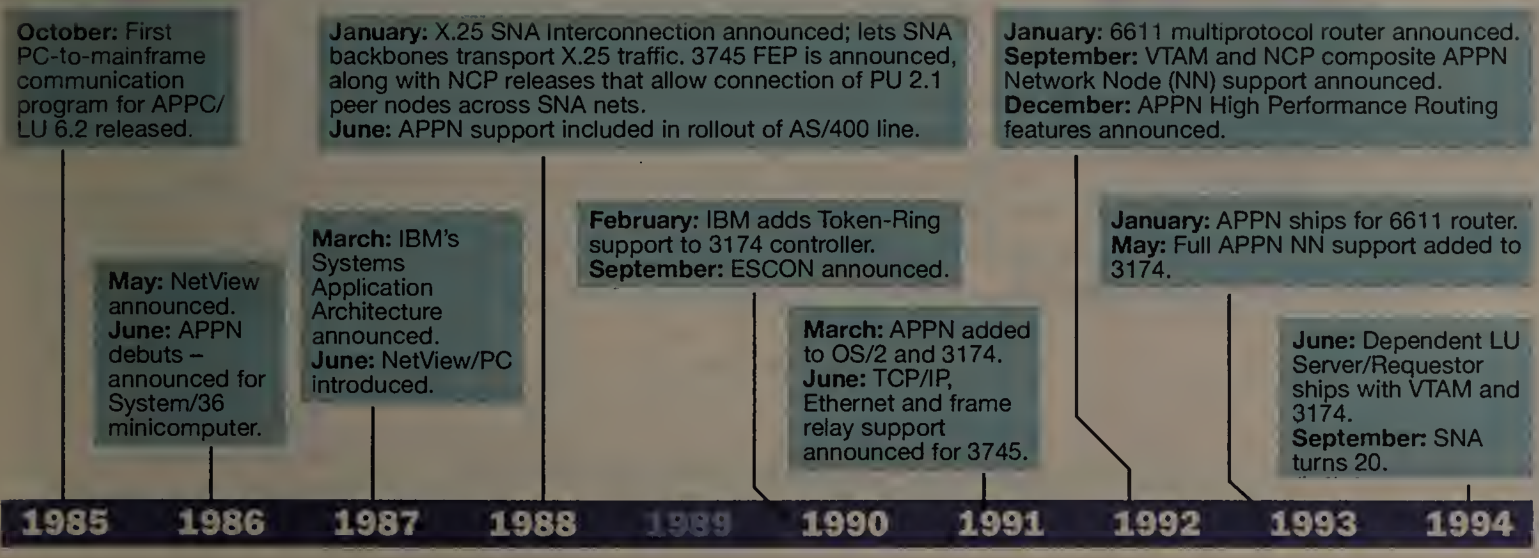
"We are looking to get better performance out of our backbone using APPN," Sanderson said. "What we really want is APPN's High Performance Routing features because then we'll have improved network efficiency and the ability to route around failures."

The agency already has a small APPN net made up of eight Application System/400s. His experience with that net has Sanderson anxious to deploy APPN's directory server feature, which is a central repository for all resources in an APPN net, in the mainframe environment.

The directory server reduces APPN network searches and should help limit broadcast searches, he said.

"We've evaluated other backbone technologies, such as TCP/IP, and we feel that they remove some of the safeguards and reliability SNA delivers today," Sanderson said. "And we really can't live with those uncertainties.

"We know we are really at the infancy level with all of this new technology," he added. "The ultimate goal for us is complete reliability, and nothing else out there can promise us that like SNA." ⧉


October: First PC-to-mainframe communication program for APPC/LU 6.2 released.
May: NetView announced. June: APPN debuts – announced for System/36 minicomputer.
March: IBM's Systems Application Architecture announced. June: NetView/PC introduced.
January: X.25 SNA Interconnection announced; lets SNA backbones transport X.25 traffic. 3745 FEP is announced, along with NCP releases that allow connection of PU 2.1 peer nodes across SNA nets. June: APPN support included in rollout of AS/400 line.
February: IBM adds Token-Ring support to 3174 controller. September: ESCON announced.
March: APPN added to OS/2 and 3174. June: TCP/IP, Ethernet and frame relay support announced for 3745.
January: 6611 multiprotocol router announced. September: VTAM and NCP composite APPN Network Node (NN) support announced. December: APPN High Performance Routing features announced.
January: APPN ships for 6611 router. May: Full APPN NN support added to 3174.
June: Dependent LU Server/Requestor ships with VTAM and 3174. September: SNA turns 20.
1985
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Oracle

Continued from page 11

the physical location of mainframe data they are accessing. Users specify the tables they wish to access, and Oracle Gateway for EDA/SQL will locate the data, the company said.

Oracle Gateway for EDA/SQL will be a bundle of Oracle's SQLNet for MVS, Oracle7 for MVS, Oracle's Transparent Gateway and EDA/SQL.

Oracle said the new gateway will allow users to take advantage of key features of the Oracle7 database. For instance, it will let users perform joins across mainframe tables, use Oracle's flavor of SQL to generate queries, perform two-phase commits and replicate data.

"Even though I don't have ISAM or VSAM data sources, I could use something like this to link to external data sources at other colleges," said Peter Detrick, chief information officer at City College of San Francisco, a heavy user of Oracle databases.

Analysts said the move is important for Oracle, which fell behind rival Sybase, Inc. in the mainframe gateway area following Sybase's acquisition Micro Decisionware, Inc. last year.

"Oracle had to do something to improve its gateway strategy," explained Wayne Eckerson, an analyst at the Boston-based Patricia Seybold Group, Inc. "It was inevitable that they partner up with IBI, the biggest independent player in the mainframe gateway market."

Oracle Gateway for EDA/SQL will be available from both Oracle and IBI, but technical support will be handled by Oracle. Pricing was not available.

©Oracle: (415) 506-7000; IBI: (212) 736-4433.

LAN switching

Continued from page 4

conversations at full wire speed.

TigerSwitch, which will support more than 8,000 media access control addresses, will have an aggregate throughput of more than 170,000 packet/sec and filter packets at nearly 360,000 packet/sec based on user-selectable options, including source address, destination address and entry/exit port.

"It's essentially a bandwidth accelerator for the workgroup environment," said one source.

The device will support store-and-forward switching, meaning it performs error checking on each packet, which prevents propagation of bad packets.

Initially, users will be able to trunk as many as eight Ethernet ports together to provide an 80M bit/sec highway between two TigerSwitches or a TigerSwitch and a high-performance server. Future releases will support high-speed spigots of both flavors of 100M bit/sec Ethernet – 100Base-T and 100VG-AnyLAN – as well as Asynchronous Transfer Mode.

According to an industry source, there are no plans to support a Fiber Distributed Data Interface because SMC believes a direct connection to an FDDI backbone will have a negative impact on both the workgroup switching and performance of the backbone.

TigerSwitch, which will support the Simple Network Management Protocol, will allow users to create virtual networks, relying on the ES/1 or an existing router to route traffic between those virtual LANs.

"This product will put SMC into a better position because it gives them a low-end complement to their high-end switching expertise, which will allow them to be aggressive with end-to-end system sells," McClimans said. "Alantec [Corp.] may be the only other company that can claim that now."

TigerSwitch will be available next month for $9,450. ⧉

Comments?

See "Contacts" box on page 2.

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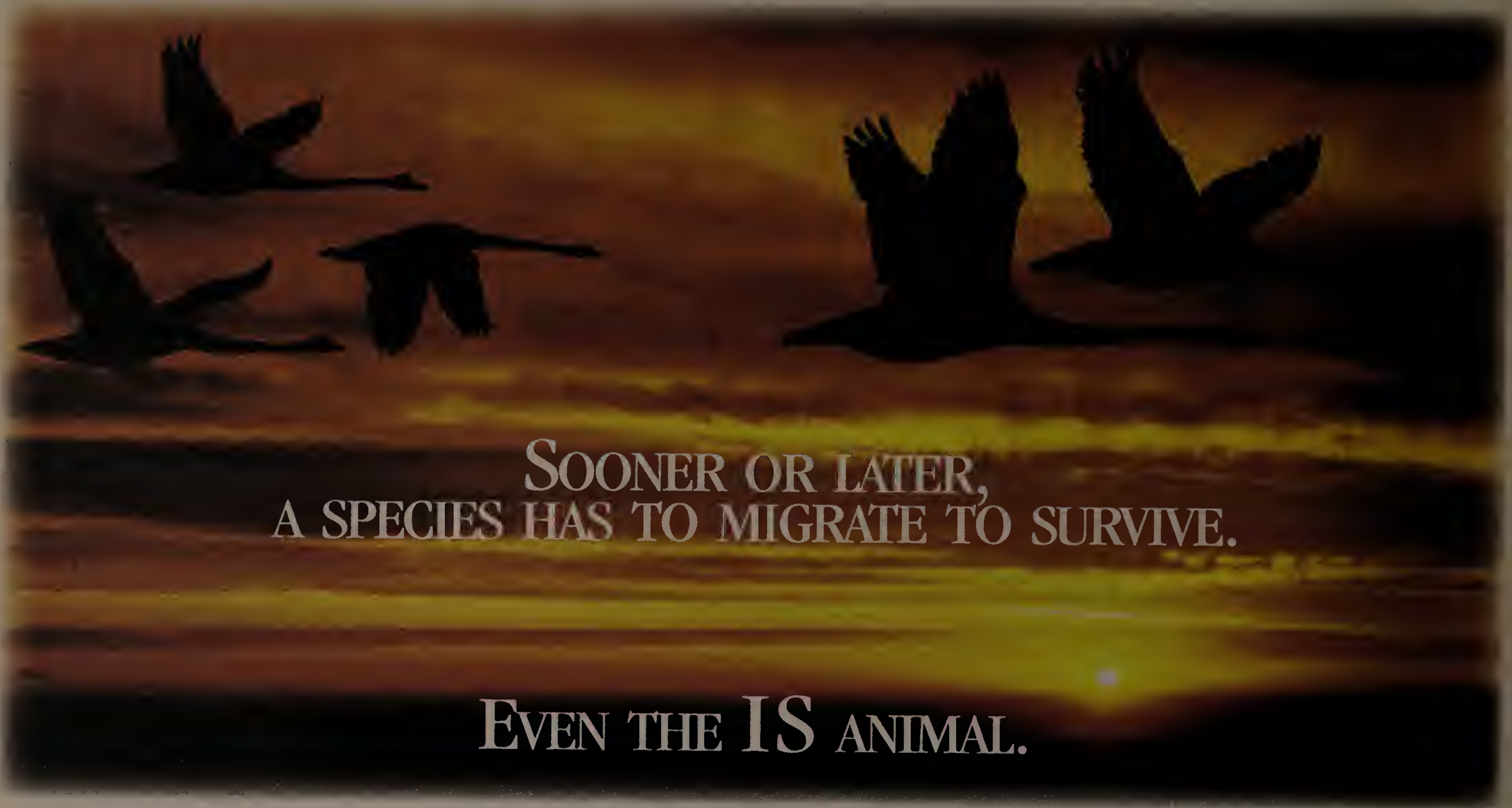

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BRIEFS

Frontier Software Development, Inc. has announced Version 3.0 of its **NetScout Manager** front end for Remote Monitoring diagnostic tools. Version 3.0 features 10 new applications for monitoring protocols, LAN traffic and Management Information Bases, and an icon-based interface.

NetScout Manager 3.0 costs $2,995 for Windows versions and $4,995 for Unix platforms. It will be available in September.

Frontier: (508) 851-5700.

Shiva Corp. last week announced availability of release 3.0 software for its **LanRover/Plus** remote access servers.

The new software adds LAN-to-LAN dial-up routing to the LanRover/Plus, which previously supported just individual users over analog modem links. Version 3.0 also supports simultaneous multiprotocol access and lets users with different types of platforms — Unix, Apple and PC — all share the same phone number. Security enhancements were also added.

LanRover/Plus 3.0 for Ethernet ranges in price from $4,299 to $8,499, depending on configuration. Token-ring configurations cost $1,000 more.

Shiva: (617) 270-8300.

Cayman Systems, Inc., will introduce Version 3.03 of its **GatorAccess MP** remote access server at NetWorld+Interop in Atlanta next week.

The new version includes a Windows-based point-and-click installation utility that automates modem and user configuration. Version 3.03 also supports the Windows virtual device driver and allows modem sharing for NetWare users dialing out from the LAN.

The new version is available this month starting at $2,995.

Cayman: (617) 932-1100.

Cisco Systems, Inc. has unveiled an enhanced version of its **Internetwork Operating System** software that is designed to boost performance and scalability of **X.25** networks.

Enhancements include ISDN B- and D-channel access, payload compression, multiprotocol virtual circuits, support for IBM's Qualified Logical Link Control protocol and dynamic one-hop routing. The extensions will help X.25 users move from traditional terminal-to-host to client/server environments or gain higher bandwidth on existing X.25 networks for larger scale applications.

The enhancements will be available in September, except for ISDN D-channel support and dynamic one-hop routing, which will be available in the first half of 1995.

Cisco: (408) 526-4000.

Andrew Grant Associates, an Ann Arbor, Mich.-based consultant to the automobile industry, last week introduced **JITstar,** a Unix-based computer and software package for managing order fulfillment and warehousing.

The four software modules shipped with JITstar include electronic data interchange for order entry, shipping and accounts receivable, plus inventory control software.

Andrew Grant Associates: (313) 426-4800.

LightStream unveils next generation

Uses Interop conference to intro ATM switch for integrating routing/bridging.

BY MICHAEL CSENGER

Billerica, Mass.

LightStream Corp. next week will introduce a version of its wide-area and campus backbone ATM switch that supports legacy local network traffic, plus new bridging and routing features.

The new version, called the LightStream 2020, builds on the LightStream's existing 2010 Asynchronous Transfer Mode switch. The first release offers enterprisewide virtual LAN support, bridging and limited routing to filter traffic going over the wide area. A later release, due early next year, will integrate full Layer 3 multiprotocol routing.

Anand Parikh, LightStream's vice president of strategic business development, confirmed the firm would announce the 2020 at the NetWorld+Interop show in Atlanta. He declined to provide pricing and other details but did confirm the firm's routing direction.

"The best way to visualize this is that a router will be able to talk to our switch as a peer, as another router," Parikh said. "The router will look across the entire LightStream network and see any other router as just one hop away."

LightStream has been shipping its 2010 switch since late last year, focusing on wide-area ATM interfaces of up to OC-3 speed as well as frame relay support.

The intent with the 2020 is to provide more than a simple LAN interface to the ATM network, said Nick Lippis, president of Strategic Networks Consulting, Inc. in Rockland, Mass.

"This isn't just a new feature set," Lippis said. "It's a whole new class of internetworking product."

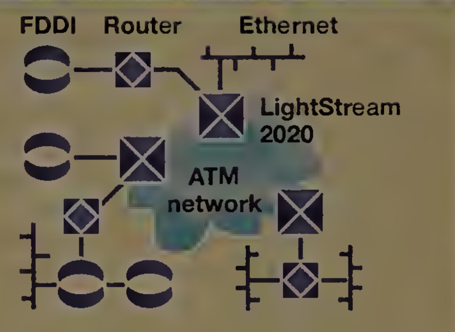
LightStream is one of the first companies to integrate higher level routing and bridging with cell relay technology, Lippis said. "They really have something here, and it's surprising to realize that the least interesting aspect of it is ATM."

With integrated bridging and routing, the 2020 could be used in backbone nodes where even the next-generation routers lack sufficient capacity. Such a backbone would simplify router management and provide wide-area efficiencies using ATM's cell transport.

"It's the difference between routers making use of ATM circuits across the backbone vs. routing that can use the dynamic bandwidth capabilities and class-of-service guarantees that ATM provides," Lippis said.

See **LightStream**, *page 16*

LightStream 2020 adds routing to ATM



The LightStream 2020 Release 1 supports Ethernet and FDDI bridging with WAN filtering. The next release will integrate Layer 3 multiprotocol routing with ATM capabilities.

GRAPHIC BY SUSAN J. CHAMPENY

RMON makes users more productive and saves money

BY JIM DUFFY

Boulder, Colo.

Users are realizing dramatic gains in productivity while reducing costs by deploying devices that support the RMON MIB to manage internetworked LANs.

The benefits of the Remote Monitoring Management Information Base could open up new uses for the technology in systems management and network design applications, analysts said.

The news is especially good for large enterprise net users, according to a study conducted by McConnell Consulting, Inc., because costs savings and staff productivity go up as the number of RMON-managed LAN segments increases.

"It's about 150% productivity gain at the very largest [network] we looked at," said John McConnell, president of McConnell Consulting, based here. "It was about 30% down at the low end. It shows the kind of value remote monitoring starts to provide."

The study surveyed 272 companies with $10 million to $10 billion in annual revenue. Of that sampling, 176 were using RMON and 96 were not.

The study was commissioned by multiple vendor clients, McConnell said.

According to the study, an organization with one to 10 RMON-managed LAN segments can realize a savings in management costs of $21,000 over a comparable network at another organization that does not use RMON. Likewise, an enterprise with 200 or more RMON-equipped LAN segments can save nearly $400,000 in management costs using RMON (see graphic).

Such productivity and savings gains are boosting RMON's appeal beyond monitoring traffic on interconnected LAN segments, McConnell said. Users would like to see the same economics applied to systems management and network design, as well.

"There's a lot of leverage that can be gained with the kind of information that probes collect," he said.

McConnell said RMON could work hand-in-hand with Desktop Management Task Force and intelligent agent software for systems management to monitor applications, profile system performance and capacity, manage inventory and assets, as well as model and simulate traffic behavior.

For instance, some vendors are developing chargeback applications that allocate costs based on net usage, he said. And Make Systems, Inc. is feeding RMON-collected data right into its NetMaker modeling and simulation tools so users can model nets with real-time operational statistics.

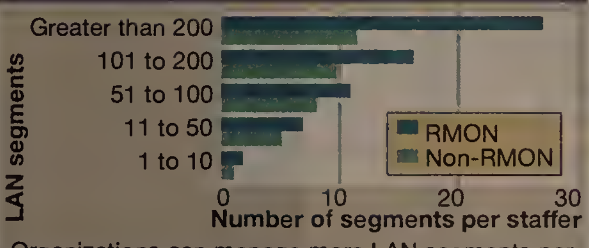
McConnell said there will be more of those types of applications to come; the productivity and cost savings are a couple of reasons, and the expense of systems management agent software is another.

"You have to buy agents at $500 to $1,000 for each system that you want to instrument," he said. "And quite often you need multiple agents to do all the functions."

RMON can substitute for a good portion of that, McConnell noted. An RMON probe, for example, can gather all of the data, filter it to look for application-level traffic, then send it to the systems manager.

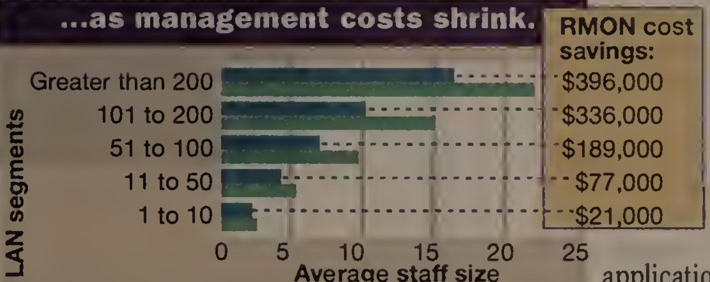
©McConnell Consulting: (303) 444-8908.

Staff productivity gains...



Organizations can manage more LAN segments per management staffer when using RMON.

...as management costs shrink.



Management cost savings gained by using RMON increase as the size of the network grows.

SOURCE: McCONNELL CONSULTING, INC., BOULDER, COLO.
GRAPHIC BY SUSAN J. CHAMPENY

Firm looks to communicate with auto consumers over the Internet

BY ELLEN MESSMER

Milwaukee

Manufacturer Johnson Controls, Inc. has started using the Internet for exchanging computer-aided design and manufacturing files and electronic mail with the Big Three automobile makers.

The company established Internet access for 6,000 employees last spring, and engineers have begun exchanging files with their counterparts at Chrysler Corp., Ford Motor Co. and General Motors Corp. Mindful of security concerns related to using the Internet for intercompany communications, the company has also established a network fire wall to prevent unauthorized access to its corporate net.

Johnson Controls is turning the Internet into a tool for its just-in-time manufacturing process for building automobile seats.

"We deliver the seats within two hours of the car being produced," said Kevin Roels, senior interactive computing and systems manager for the company.

Often, engineers from the Big Three automakers have to make last-minute changes in their designs. Normally, this requires them to remain on site at Johnson Controls to make adjustments in CAD/CAM designs.

As an alternative, the firm began letting the engineers transmit their design changes directly over the Internet into the Johnson Controls CAD/CAM workstations running X Window System. The changes are then fed into the machine tools cutting the seat pieces.

Roels said he is polling Johnson Controls employees for other ideas on how to use the Internet. One idea under consideration is using the 'Net to sell time on the company's rapid prototyping machines.

"Moving data back and forth from them is difficult, but the Internet could be used for this," Roels said.

The firm may soon advertise the time-sharing service on a Mosaic server.

All of the Internet activities at Johnson Controls did not commence before security procedures were put in place, however. The company's network fire wall is supplied as an annual leased service called InterLock from Advanced Network & Services, Inc.

The fire wall is set up to let all Johnson Controls employees freely send and receive Internet mail. But remote access to applications such as file transfer, virtual terminal and X Window System is denied to all except designated Johnson Controls employees and specific clients with authorized logon IDs and passwords.

The fire wall, an IBM RISC System/6000 computer running a modified version of the AIX operating system, sits between the Internet and a dedicated 56K bit/sec line from Johnson Controls.

"It used to be that only the research people wanted to use the Internet, so we had our own fire wall based on a router," Roels said. "But more of our nonresearch people wanted to use the Internet for business purposes. So for the 6,000 people we have on the Internet now, we basically decided to outsource the headache of maintaining a fire wall to ANS."

LightStream

Continued from page 15

Sources familiar with LightStream's plans said the company will introduce Fiber Distributed Data Interface and Ethernet interfaces that allow native LAN interworking over an ATM backbone.

With the OC-3 ATM interfaces, users could create a campus or wide-area backbone that supports both Ethernet and FDDI at their respective wire speeds.

Virtual LAN abilities were already developed for the earlier 2010 switch but served no purpose without LAN interfaces. The 2020 will support virtual LAN capabilities that use LightStream's proprietary switched virtual circuit (SVC) abilities between switch nodes.

User-to-network SVCs are not yet supported but are expected next year.

Sources said LightStream will support IP, IPX, the Open Shortest Path First and other major Layer 3 routing protocols next year. Routing support will be integrated on LightStream's LAN interface cards, such as the two-port FDDI and eight-port Ethernet cards being introduced this month.

Pricing for the 2020 is expected to range between $22,000 and $300,000, depending on configuration, sources said.

Also according to sources, LightStream will demonstrate its LAN interworking with the first of Cisco Systems, Inc.'s Fusion ATM products at the show.

✆LightStream: (508) 262-1000.

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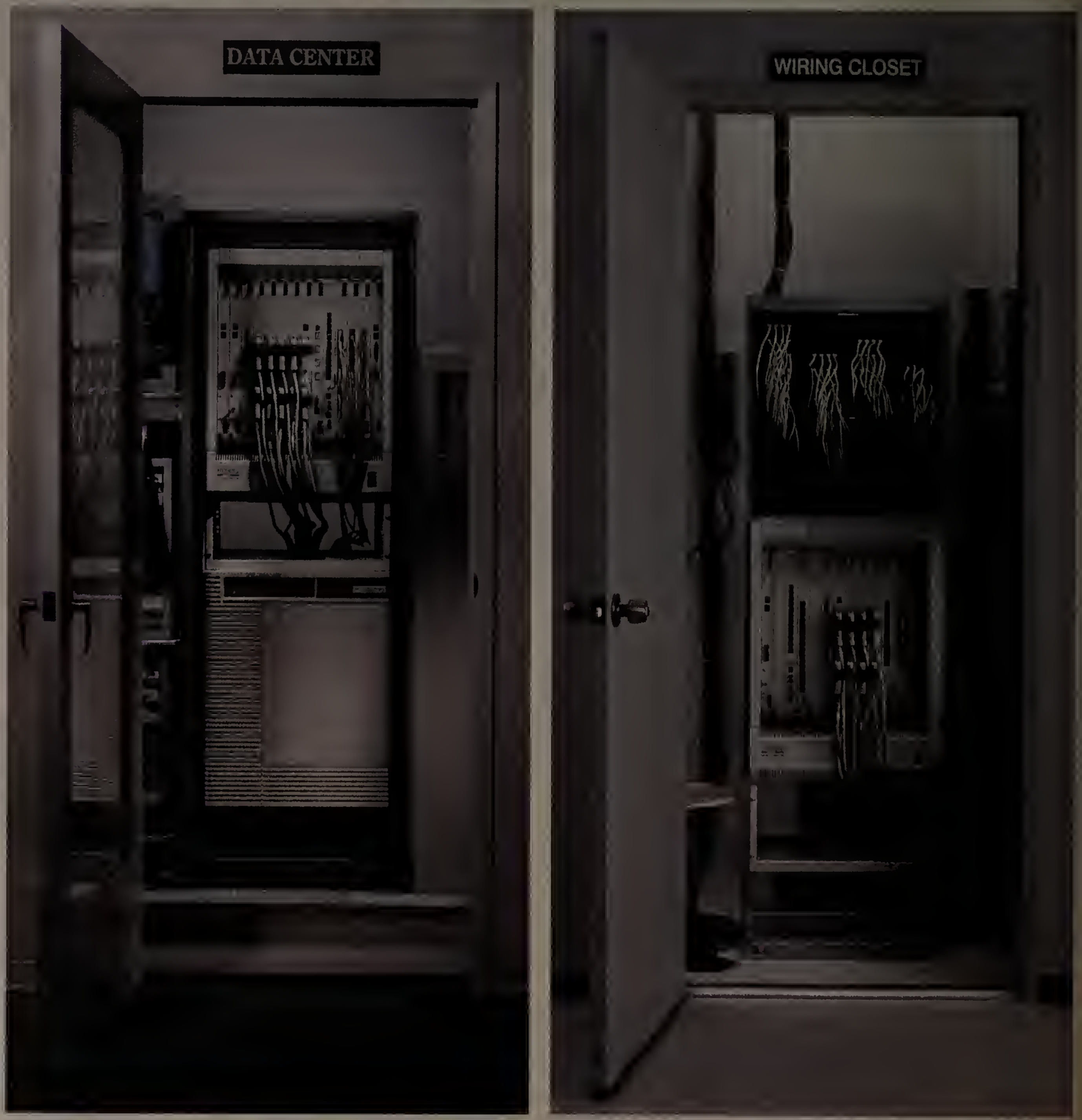

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INTERNETWORKING MONITOR

by Scott Bradner

'Stupid is as stupid does'

Well I guess it's that time again. It has been a few months since I last talked about the ability of Apple Computer, Inc. to snatch stupidity out of what seemed to be a smart move, but it has done it again.

Finally Apple is producing a new version of its operating system that will include inherent support for TCP/IP. In addition to the IP support, System 7.5 has a bunch of other features and improvements, ranging from the "why bother" through "gee — that's neat" to "gotta have that." Most of these features are not things that the user will exercise directly, even though System 7.5 ads say "breakthrough functionality and ease of use."

The things that users do deal with directly seem to generally fall into the "OK, I'll use that" category. An example is a feature called window shade that lets you collapse a window (Can I still use that word now that Microsoft has a trademark on the term? Well, maybe it's OK since the trademark is on "Windows" and not "window." I'll have to be careful though.) so just its title bar shows. It is an improvement, but not nearly as useful as the ability to reduce a window to an icon as you can in the MIT X Window System.

The new ability to read and write MS-DOS disks is also quite nice — even if many of us had been doing that for quite a while with third-party software.

APPLICATION ENABLERS

Most of the more interesting additions are enablers — they enable an application to perform a function that it was not previously able to do. MacTCP, Apple's way of spelling TCP/IP; Drag and Drop, an updated version of cut and paste; and PowerTalk, as far as I know a not-to-any-real-standard electronics communications manager, are only useful if there are applications that utilize the new features.

Why bring this up? Well here is where the Microsoft "mole" inside of Apple made his, or her, move.

Apple priced this upgrade at about three times what IBM and Microsoft priced their system upgrades, which made more of a difference to those operating systems than System 7.5 will for Apple. Apple is asking $134.99 list price, with the cost running to many thousands for a large site.

Doesn't the company understand that unless the enablers are widely installed, software developers will have little incentive to rely on them? What good will they do if they are not used?

Why should I care? As I mentioned in a previous column, I saw my first Macintosh back in '83 and have used one as my primary or secondary computer ever since. When the Macintosh was not my primary computer, a Unix workstation was. When I first saw the Macintosh, I concluded that these people understood the operational paradigm that I wanted to work with. I had seen the Altos at Xerox PARC so I was primed. But here it was, and I could get one of my own. I now have three, a VX at home that I'm about to upgrade to be a PowerPC, a Duo 230 that is my portable computing environment and a PowerPC 8100 at work. As an aside, in order to merge my two favorite computing environments, I run Mach10, a full Berkeley-style Unix, on all three.

MACS AND MINIVANS

I have recommended Macintoshes to many people in the same spirit that I've recommended minivans ever since I bought my first one back in '84. It is human nature that makes a person want to have made the right choice and gets them to recommend their choice to others. Apple keeps getting me into the position of having to apologize for my recommendation, and that don't make me happy.

No, I don't know that there is a Microsoft mole in Apple; it just may be a natural, homegrown ability to do the dumb thing that is driving Apple so resolutely along the path of lesser differentiation of its product line.

Disclaimer: Although many people at Harvard use Macintoshes and a similar number use PCs, the university takes no stand on these issues, so it must be my own frustration speaking.

➡ Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at sob@harvard.edu.

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SLOTS/ SEGMENTS	14/168	17/100	14/52	14/112
MAX. PORT DENSITY	500	200	240	336
TOPOLOGIES	Ethernet, Token Ring, FDDI, ATM	Ethernet, Token Ring, FDDI, ATM	Ethernet, Token Ring, FDDI	Ethernet, Token Ring, FDDI, ATM
ROUTING	IP, IPX, DECnet, Appletalk	No Routing	No Routing	IP, IPX, DECnet Phase IV, AppleTalk, XNS, DSI, X.25, RIP, OSPF, BGP, ES-IS, IS-IS, Transparent Bridging and Source Route Bridging
STARTING PRICE*	$417/port	$200/port	$223/port	$160/port

*Pricing and other chart information was compiled from multiple industry resources as of 3/94.

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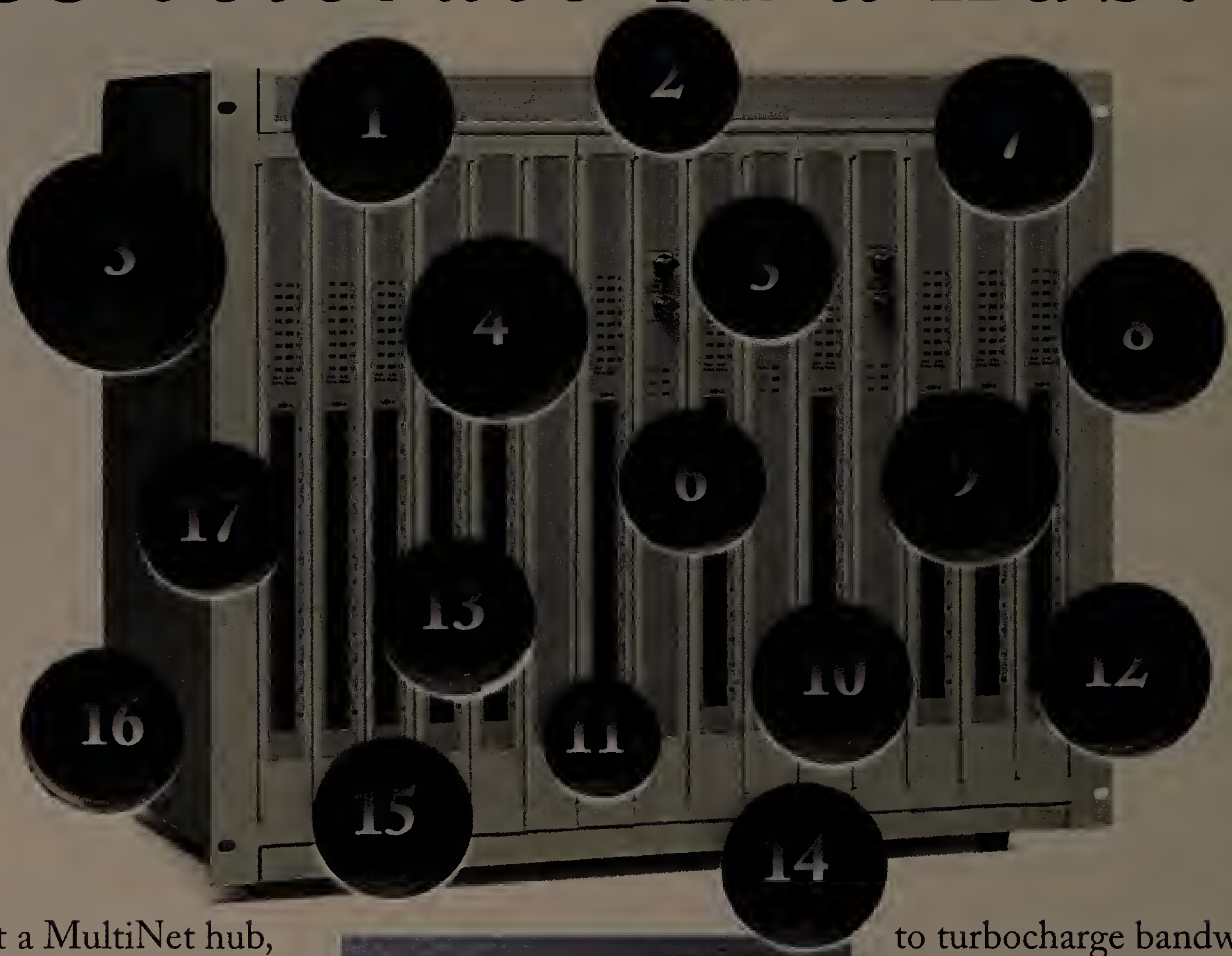
*H*OW MANY FAULTS are you willing to *tolerate* in a hub?



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OTHER HUBS ARE FULL [illegible] ONLY MULTINET COVERS E[illegible] POINT OF POTENTIAL FAILURE.

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2. Distributed repeaters
3. Hot swappable modules
4. Redundant hub buses
5. Distributed h/w-based switching [illegible]
6. Back-up power supplies
7. Token Ring speed detection

BACKBONE LINKS

8. Redundant backbone link port[illegible]
9. Software-configured redundant hu[illegible]
10. Redundant WAN brid[illegible]

LINKS TO NODES

11. Redundant ports
12. Plus Mode monitors b[illegible]
13. Synchronous Ethernet
14. Transceivers support r[illegible]

NETWORK MANAGEMENT

15. SNMP agent re[illegible]ts to [illegible]
16. Distributed configuration [illegible]
17. Out-of-ba[illegible]

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Cabletron unveils microsegmentation module for its hub

BY SKIP MACASKILL

Rochester, N.H.

Cabletron Systems, Inc. this week will roll out a new module for its MMAC-Plus intelligent hub that allows users to link multiple Ethernet segments via routing, bridging or switching.

The Ethernet MicroLAN Extension Module, which is divided into three groups of four 10Base-T ports, is designed to let users attached to any of the 10Base-T port groupings (LAN segments) communicate with those on the other segments.

Each port on the module can be used to support a workgroup or chassis-based hub or a mission-critical network device, such as a file server, providing users on each LAN segment with access to other users and network resources on the same segment. This setup eliminates interference from traffic running across the segments supported by the module.

Each LAN segment will also support a fifth port via an Ethernet Port Interface Module (EPIM), which can be configured as an unshielded or shielded twisted-pair, coaxial cable, multimode fiber or single-mode fiber connection. The EPIM provides the user with a number of options, such as using a fiber link to connect the module to a distant workgroup device.

Traffic between the different LAN segments can be bridged, routed or switched by loading the appropriate software onto a Reduced Instruction Set Computing-based Intel Corp. i960 microprocessor on the module.

IP, IPX and DECnet routing, as well as bridging, will be available on the initial release during the fourth quarter. AppleTalk and support for the Open Shortest Path First routing protocol will be added in first quarter of next year.

Cabletron's SecureFast Packet Switching scheme, which converts packets into fixed-length cells for transport across a high-speed backplane, will be available on the module in the second quarter of 1995.

Since the MMAC-Plus architecture requires no network management modules, users could fill the hub with as many as 14 MicroLAN modules and support as many as 42 different Ethernet segments and a total of 168 switched LAN ports.

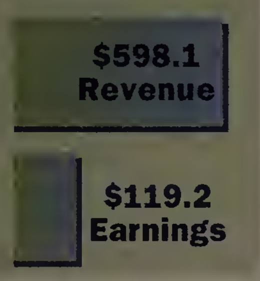
The module, which plugs into the hub's 400M bit/sec Flexible Network Bus backplane, also supports the Simple Network Management Protocol and all nine Remote Monitoring Ethernet groups.

Cabletron's Distributed LAN Monitor proxy agent, which compiles network management information for the entire module and interacts with any SNMP net management platform, is also supported.

The module will be available in 90 days and cost $9,995.

©Cabletron: (603) 332-9400.

Cabletron, which has more than 56,000 customer sites worldwide, reported record revenue of $598.1 million and earnings of $119.2 million for its 1994 fiscal year ended Feb. 28.



Agile moves nimbly into net border mart

Start-up pitches Ethernet-to-ATM switching system, new virtual LAN scheme.

BY SKIP MACASKILL

Waltham, Mass.

Agile Networks, Inc. last week unveiled an Ethernet-to-ATM switch that will help users transition their shared-bandwidth networks to Asynchronous Transfer Mode backbone environments via a combination of switching and routing.

The company also announced a network management application for the switch and offered up its method of building virtual local networks, dubbed Relational Networking (*NW*, May 23, page 1).

The ATMizer 125 Relational Switch, which combines a 12-port Ethernet LAN switch with a five-port ATM switch in a single chassis, gives users dedicated 10M bit/sec Ethernet pipes to individual LAN segments, as well as access to resources and public network services located on ATM backbones.

"Transition is the key word here," said John McQuillan, president of McQuillan Consulting in Cambridge, Mass. "Users want to transition to faster LANs with better manageability, and devices such as ATMizer help them get there."

The LAN switch supports both 10Base-T and 10Base-FL interfaces, and the ATM switch offers both User-to-Network and Network-to-Network Interfaces. The two switches are linked via an internal ATM connection. The store-and-forward Ethernet switch also supports the segmentation and reassembly intelligence needed to convert Ethernet packets into ATM cells.

The internal ATM switch, which supports a 65,000-cell buffer that is dynamically allocated as needed, offers four output priority queues to ensure that the most critical traffic will be forwarded first.

ATMizer also offers two Reduced Instruction Set Computing-based processors that support LAN and ATM management software. The ATM Connection Manager chip monitors the ATM backbone topology and performs call setup functions, while the Relational LAN Manager detects how end stations are related to one another based on protocol types and subnet addresses.

Analyst John McQuillan (left) and beta user Tim Kuhfuss last week helped Agile roll out its ATMizer switch.

Both interact with the Agile ATMman Relational Network Manager application that runs on a Unix workstation connected to ATMizer. ATMman, which supports the Simple Network Management Protocol as well as SNMP Version 2, provides policy management and event logging for ATMizer.

One of the biggest questions surrounding this new class of network border devices is how they interact with existing backbone routers. Some products, such as those from Centillion Networks, Inc., rely completely on existing routers to move traffic locally between subnets as needed; others, such as those from Xylan Corp., support routing protocol stacks that off-load some of the local routing functionality from the installed backbone device.

According to Bill Seifert, president of Agile, the company's Relational Networking scheme offers a more elegant routing solution that gives it an edge.

Under Relational Networking, the ATMizer can automatically group users into virtual LANs based on protocol type and subnetwork address.

"ATMizer examines the network layer content of each packet and then makes an intelligent forwarding decision to ensure that broadcast and multicast frames only go to other users who are part of the same relational LAN," he said. "When a user moves, ATMizer will automatically connect him to the appropriate relational LAN, meaning the network adapts to the user."

This approach lets the existing router act as a gateway through which traffic only enters when it is destined for the wide area or needs to go between different relational LANs.

ATMizer beta users were pleased with the product.

"ATMizer will help us deal with the tremendous growth our network has experienced lately, with the number of subnets doubling in the last year alone," said Chuck Von Lichtenberg, network systems manager at Boston University. "With all the moves,

See Agile, *page 24*

BRIEFS

Cisco Systems, Inc. last week unveiled new software for its Catalyst LAN switch that will enhance management of **switched internetworks.** The software allows network managers to monitor traffic patterns and network utilization via an integrated Remote Monitoring agent. Also, a Switched Port Analyzer feature allows users to troubleshoot, tune and expand switched internetworks.

Lastly, Multilayer Switching Services permit segmentation of multiple LANs, regardless of physical location, which lets net managers control switched traffic within the workgroup while deploying virtual nets across the backbone. The Catalyst software options are priced from $2,995 to $5,500 and will be available in November.

Cisco: (408) 526-4000.

NetWorth, Inc. last week announced new capabilities for its PowerPipes Switching Hub family that fine-tunes the device for Novell, Inc. NetWare nets. Through the use of four new **NetWare Loadable Modules (NLM)** that run on a NetWare server, NetWorth has optimized the performance between the server and its PowerPipes Ethernet switch.

The NLMs make the server aware that it is attached to a switch, as well as help the server perform flow control, automatically switch to a backup link and disable internal routing in NetWare environments.

NetWorth: (214) 929-1700.

InterConnections, Inc. last week announced that it will bundle Novell, Inc.'s **NetWare for LAT** software with its own Leverage Gateway Services, which is a set of NetWare Loadable Modules that provide networking services such as session management and bidirectional printing.

These capabilities will now be available in NetWare for LAT networks, which interconnect Digital Equipment Corp. Local Area Transport nets with NetWare IPX environments.

Available now, the new bundled package ranges in price from $1,595 to $9,595, depending on the number of users.

InterConnections: (206) 881-5773.

Racore Computer Products, Inc. last week rolled out Industry Standard Architecture (ISA)- and Extended ISA (EISA)-based net interface cards that support the emerging **100VG-AnyLAN** standard for running token-ring and Ethernet nets at 100M bit/sec. A 100VG-AnyLAN adapter for Peripheral Component Interconnection bus types is set for the fourth quarter. Available this month, the ISA card costs $395 and the EISA adapter costs $545.

Racore: (800) 635-1274.

Apple Computer, Inc. has unveiled the Apple Ethernet 10T/5 Workgroup Hub — a five-port **10Base-T hub** with an attachment unit interface and four RJ-45 connectors. Available in October, the hub costs $149.

Apple: (408) 862-3385.

NET RESULTS

by Mark Gibbs

Bill, the Little Red Hen

Do you remember the children's story of the Little Red Hen?

The Little Red Hen (who we shall now refer to as the LRH for brevity) wanted to make a loaf of bread but lacked the ingredients. So she decided to grow some wheat – obviously a believer in starting from scratch. The LRH asked the other animals in the farmyard something like "Want to help me plant the wheat?" A resounding "Don't call us, we'll call you" was the response.

To cut a long and not terribly riveting story somewhat shorter, at every stage of growing, harvesting, milling and baking, the LRH invited the other animals to get involved and every time they said they had better things to do.

At the end of this timeless fable, the LRH produced the finished goods – to wit, one fragrant, steaming, mouth-watering, voluptuous loaf.

Now it was at that point that all of the animals offered to help her eat the loaf and the LRH politely told them to get lost. She ate it herself.

A fine story with a solid, if somewhat obvious and basic, moral.

THE MORAL OF THE STORY

Now why should I be telling you fables? Well, it seems to me that the Department of Justice doesn't understand the moral of this tale at all.

The moral (in case you missed it) is that if you put the effort into creating something, it should be yours to do with as you wish. But the Justice Department doesn't see things that way in the case of Microsoft Corp.

Microsoft Chief Executive Officer Bill Gates built a company bigger than the economy of many countries from the ground up. He was the right guy, in the right place, at the right time, with the right products and the right skills.

In short, a combination of chance and ability got him to the top of the hill.

The result is that Mr. Gates, as we all know, is a kabillionaire; he's got more money than Croesus could have dreamed about. (Here's an interesting figure I just worked out: Gates has enough money that if he laid it all end to end, it would stretch 2,906,250 miles. . .but I digress.)

So in the course of building his empire, Mr. Gates cut some pretty good deals – so good that they locked his OEMs into the business equivalent of a straitjacket.

Perhaps I have a naive view of these things, but that kind of business deal doesn't seem bad to me.

It smacks of shrewd competitiveness, the kind of down-and-dirty wrestling in the mud of the marketplace that one should admire and uphold as the epitome of American business acumen.

Moreover, the case of Microsoft is different from, say, that of the telephone system or the railroads.

It is definitely not in the economic interests of the U.S. to allow the utilities or basic transportation services to become monopolies.

But a software company? Come on, Ms. Reno.

There are alternatives in that marke, and the players are free to choose.

If the market hasn't got the guts to make a choice, it is not the place of government departments that apparently have nothing better to do to make the LRH share her loaf of bread.

What we want in the networking marketplace in general and the personal computer marketplace in particular is aggressive entrepreneurial spirit.

If the other players can't compete and simply go around whining "unfair," it is not the place of the government to get involved. Just tell 'em that if they can't compete, they should go sell cars.

Nah, that's not a good idea. Then they'd just moan about Japanese imports.

The networking, PC and car markets should all be dog-eat-dog, fostering and rewarding the best capitalists. What they should not be doing, to mix a metaphor, is trying to cook the Little Red Hen that laid a golden egg.

➻Gibbs is a consultant and writer in Ventura, Calif. He can be reached at (800) 622-1108, Ext. 504, or on the Internet at mgibbs@rain.org.

Comm servers could spare users branch office bucks

BY MICHAEL CSENGER

Mountain View, Calif.

CommVision Corp. today will introduce a line of branch office communications servers designed to reduce the lifetime cost of both local- and wide-area networking at remote sites.

The Communique Branch Xpress series, like CommVision's existing line of central site communications servers, consolidates multiple server functions in a single cabinet with optional feature modules.

For example, a single unit could be configured with a router, remote access server, Novell, Inc. NetWare file server, fax server, electronic mail server, Systems Network Architecture gateway and frame relay access device.

The idea is to avoid the administrative costs of supporting a collection of stand-alone devices at every branch office.

Arthur Chang, CommVision's president and chief executive officer, said a recent study by Strategic Networks Consulting in Rockland, Mass., backs up his company's approach to keeping down branch office networking costs.

According to the study, equipment purchases accounted for only 2% of the overall branch office network cost measured over a three-year lifecycle.

Recurring line charges amounted to 76%, while administration and maintenance accounted for 22%.

MULTIVENDOR CONFUSION

"So what happens," Chang said, "is that what looks like an efficient purchasing decision for each individual platform ends up being a very costly overall operating strategy. It boils down to multivendor confusion, where you have to deal with different configurations, capacity planning, network management and maintenance issues."

CommVision has developed a turnkey solution that trades absolute best-of-breed performance for a lower cost, integrated approach based on industry standards, he said.

The company's packet-based bus architecture ties together all modules in a unit. Three different base units are available: the Branch Xpress 800, 1000 and 1400, which support from 10 to 40-plus end users.

Each unit comes with Novell's NetWare MultiProtocol Router Plus and NetWare Connect installed, and all are Simple Network Management Protocol-manageable.

The Model 800 supports 10 to 20 users and has eight slots, but it is not recommended for use with the NetWare File Server.

The Model 1000, also with eight slots, is a more powerful version that supports a file server and can handle 20 to 40 users.

The Model 1400 adds a fault-tolerant power supply, plus a total of 20 slots to support offices of 40 or more people.

ONE-STOP SHOPPING

Kathryn Weldon, an analyst at The Yankee Group, a market research firm in Boston, said CommVision's one-stop shopping approach is not for everyone.

"It might depend on what stage you're at in developing an enterprisewide network," she said. "If you talked to CommVision at the beginning, as you start to deploy branch connectivity, or if you're revamping the network, their argument is compelling."

Communique Branch Xpress

Standard features:

- NetWare Multiprotocol Router Plus
- NetWare Connect
- Remote node access
- Fault-tolerant power supply (Model 1400)
- SNMP-manageable

Options:

- NetWare File Server
- Remote control access
- 1- to 8-line fax server
- SNA gateway
- X.400 E-mail
- Intelligent Ethernet hub
- ISDN BRI
- WAN support: frame relay, ISDN, X.25, PPP
- WAN speeds: 9.6K bit/sec analog to 1.544M bit/sec T-1

GRAPHIC BY TERRI MITCHELL

The Branch Xpress servers will ship at the end of this month. Base prices are $9,995, $16,995 and $21,995 for the Models 800, 1000, and 1400, respectively.

©CommVision: (415) 254-5720.

ATM demo

Continued from page 4

pating government entities. It usually takes four to eight hours to ship such images among the groups across the Internet, the labs' usual communications medium, even though all participants have T-3 Internet connections, said Tony Butzer, a senior systems engineer at EROS.

While the speed increase sounds impressive, he said, "if you do the math, that comes out to a little faster than T-1 speeds."

But TCP/IP applications "require a lot of tuning to be efficient," Butzer said, and the ATM links were brought up in just two days.

By contrast, he said, the Magic government gigabit test bed made up exclusively of Fore switches at multiple sites around the country took a year and a half to bring up.

As part of the NRAD test, simulated images of hurricanes are being delivered via satellite from the Hawaiian Islands and Norfolk, Va., to EROS, which passes them via ATM for processing to the Naval Research Lab (NRL) in Washington, D.C.

The NRL makes them available to NRAD sites here, also via ATM links, so the groups can collaborate on preventive relief measures (see photo, page 4).

In a few sites, SynOptics' EtherCell Ethernet-to-ATM translator blends shared-medium LAN traffic into the demo network. EtherCells are being deployed, along with other SynOptics gear, as part of a larger reengineering effort at NRAD.

THE BAD NEWS

While the LAN switches interoperate, the workstation ATM adapter cards are not as cooperative, Switlik said.

NRAD is running adapters from Fore, SynOptics and Interphase Corp.

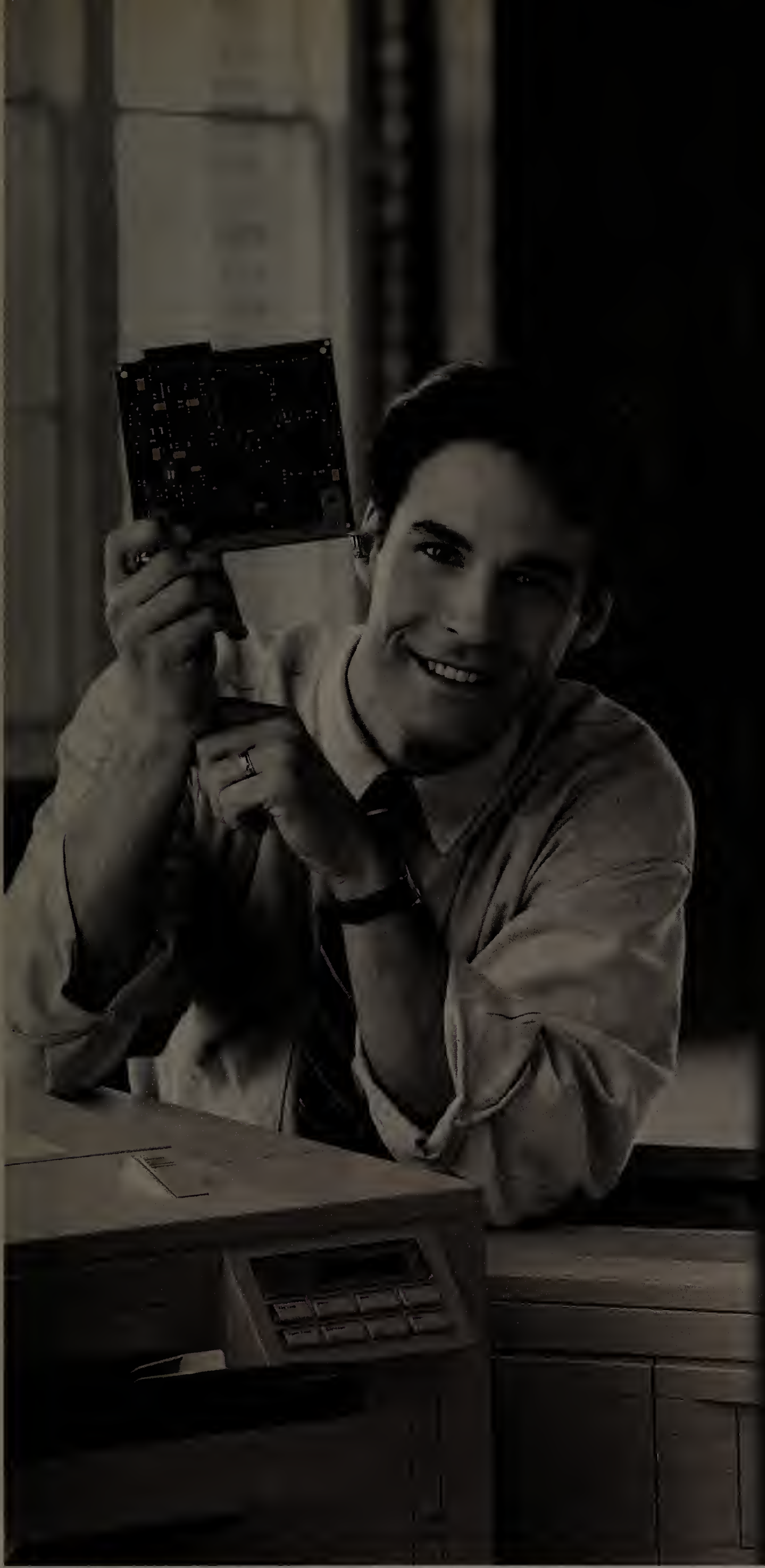
NRAD Network Engineer Mark Ganzer explained that the various vendors use differing IP-in-ATM encapsulation schemes, precluding one from being able to ping another.

In addition, SynOptics has provided only prototypes that are limited to use with Sun Microsystems, Inc.'s latest Solaris operating system version. "Most of our software is written for the SunOS operating system," Switlik said.

Also, Butzer suggested that switch configuration be done by one person. The repercussion of net engineers going their own configuration paths "is the cells get routed incorrectly," he said.

Ganzer added, "We want switched virtual circuits among different vendors' equipment as soon as possible."

Having to configure permanent virtual circuits among multiple locations with different switches "is a real headache," he said, likening it to having to, at one time, enter Internet addresses of all would-be communications partners into local servers. ◪



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InterCon Macintosh pack gains Internet functions

BY PEGGY WATT

Herndon, Va.

InterCon Systems Corp. last week released an update to the Apple Computer, Inc. Macintosh version of its TCP/Connect II communications pack that supports multimedia E-mail and enhanced Internet access functions.

TCP/Connect II Version 2.0 for the Macintosh gives LAN-based users greater access to services across TCP/IP backbones. Previously, the software's primary means of accessing non-LAN data was through terminal emulation.

Like previous versions of the software, Version 2.0 runs on Novell, Inc. NetWare, Banyan Systems, Inc. VINES, Digital Equipment Corp. DECnet and Microsoft Corp. LAN Manager LANs.

TCP/Connect 11, which features its own E-mail capabilities and can work with other E-mail packages, has been improved so that it can now retain fonts and formatting in messages received from other E-mail packages.

The software also now supports the Multi-purpose Internet Mail Extension (MIME), a standard for exchanging multimedia E-mail. This will let users attach video or sound snippets, such as a voice message recorded on disk, to E-mail messages. The software supports the speech functions in Version 7.5 of the Macintosh operating system.

"We especially like that you can include attachments in the E-mail," said Karen McCarter, a systems analyst with the National Aeronautics and Space Administration's networking group in Langley, Va. That facility has 1,700 copies of TCP/Connect II on a net supporting 2,000 Macintoshes, 2,000 PCs and 4,000 workstations.

The product's Internet access functionality, meanwhile, has been extended through support for the Point-to-Point Protocol and Serial Line Interface Protocol.

Also new is a Network News Reader and a Gopher client for the Macintosh that lets users navigate the Internet using a point-and-click Macintosh interface. This version also adds support for ftp downloads, while client support for the World-Wide Web is under development, said Brian Lichorowic, InterCon's vice president of marketing.

The update to TCP/Connect II for Macintosh adds features that mirror the enhancements added to TCP/Connect II for Windows, a product that began shipping earlier this year. That compatibility between the Macintosh and Windows products is a plus for mixed-system shops such as the University of Oklahoma, which tested a beta version of the new product and has been using TCP/Connect II for two years.

"We like the improvements, especially with our mixed environment of Macintoshes, Windows and a lot of dumb terminals," said Teresa Mercer, a net analyst with the university.

TCP/Connect II 2.0 for the Macintosh, including the remote LAN terminal emulation functions, costs $495.

InterCon also released TCP/Connect II Remote, intended for laptop use. This module, which costs $195, provides Internet access and terminal-emulation functions but does not support LAN connectivity.

©InterCon: (703) 709-5500.

HBO network manager shows off net analyzer

BY SKIP MACASKILL

Westfield, N.J.

Michael Smith, network manager at Home Box Office in New York, is living proof that necessity really is the mother of invention.

Frustrated trying to figure out whether a glitch in his Ethernet network was related to the network itself or a problem at a user's desktop, Smith developed a device to point him in the right direction.

The result of that effort was Finger Pointer, a hand-held 10Base-T network tester for nontechnical users. It can automatically verify a network connection by testing four criteria — power, link status, polarity and whether data is being received — that are represented by LEDs on the device's front panel.

Reality ✓ Check

Product: Finger Pointer
Company: Infonet Computer Systems, Inc.

The benefits:
- Quickly distinguishes between network and PC-based problems.
- Can be used by noncomputer expert.
- Low cost.

The drawbacks:
- Limited to a single application.
- No analysis functionality.

The user view:
"The device is not complex but offers a lot of information without an investment in a high-end analyzer."

Frank Terlecki

GREEN IS GOOD

To check a network connection, users remove the Ethernet connector from the back of their personal computers or workstations and plug it into Finger Pointer's hub port. If all four LEDs turn green, then the network connection is good and the problem is related to the desktop device.

"Based on information provided by Finger Pointer, the user can figure out immediately whether [to] call the network support group or the PC folks," Smith said.

"That greatly reduces the time spent troubleshooting a problem," he added.

The device also features a PC port for use by wiring technicians to test the network connection from the patch panel in a wiring closet to a specific user's PC.

Smith purposely kept Finger Pointer simple so that even desktop users can do some of the up-front troubleshooting.

"High-end analyzers can offer the same information as Finger Pointer, but they typically require a lot of technical expertise and are expensive," Smith said.

"Finger Pointer is an inexpensive way to cut the problem in half before any technician is even called," Smith added.

The product is an especially good fit for a branch office or remote location where no support technicians are likely to be on-site, he added.

IT'S ALL IN THE NAME

Frank Terlecki, director of sales for Network Resources Corp., runs a Northeastern sales office for the San Jose, Calif.-based company and has found Finger Pointer to be a valuable tool.

"The product really lives up to its name since all you do is push the button and it automatically points you in the right direction," he said. "Large organizations that support separate network and PC support groups should not be without it because it eliminates a lot of the manpower overlap that results when the network group and the PC group are trying to troubleshoot the same problem."

A more in-depth manual may be one improvement that could increase the product's value, according to Terlecki.

"While it's great that the instructions are simple enough to essentially tape to the back of the device, it might be nice to have an accompanying manual that offers suggestions on what the source of a problem might be," Smith said.

"If certain lights don't turn green, for example, it would be nice to have a list of possible reasons why [they didn't],' he added.'

Smith is marketing Finger Pointer under the umbrella of his own consulting company — Infonet Computer Systems, Inc., based here. He has applied for a patent on the device, which is available now for $249.

©Infonet: (908) 789-1257.

HIGH-SPEED CONNECTIVITY

3Com goes enterprisewide with fast Ethernet products

BY SKIP MACASKILL

Santa Clara, Calif.

3Com Corp. this week will provide details on how and when it will deliver a full suite of fast Ethernet products that will allow users to integrate the technology at any point on their enterprise network.

The product suite, based on the emerging 100Base-T standard for 100M bit/sec Ethernet, will include adapters, hubs, bridge/routers, LAN switches and network management.

"We've advised users not to buy into fast Ethernet until the three main components — [network interface cards], hubs/switches and routers — were available, and 3Com is the first vendor to" lay out its plans, said Melinda Le Baron, research director at Gartner Group, Inc., a consultancy in Stamford, Conn. "The extent to which the market will take off is directly related to pricing."

While 3Com will only provide sketchy pricing information at this point, it detailed shipping time frames for the following products:

- 10/100Base-TX adapter cards for both Extended Industry Standard Architecture and Peripheral Component Interconnection bus types will ship by the fourth quarter for under $300.
- A stackable 100Base-TX repeater with an optional 10/100 bridge/management unit for low-cost desktop connections will be ready in early 1995.
- 10/100Base-T4 adapters and a SuperStack repeater (at less than $250 per port) that support 100Base-T over Category 3 unshielded twisted-pair cabling are scheduled to ship in the first half of 1995.
- A 100Base-T interface module for its NetBuilder II bridge/router designed to route fast Ethernet traffic into Ethernet, Fiber Distributed Data Interface, Asynchronous Transfer Mode and wide-area net environments will be ready in the first half of 1995.
- A SuperStack Ethernet switch with a 100Base-T uplink will ship in the second half of 1995; a SuperStack 100Base-T switch and 100Base-T interface module for its LANplex 6000 switching hub will be ready then.
- A LinkBuilder MultiServices Hub (MSH) Ethernet switch with a fast Ethernet uplink module and an MSH 100Base-T switch module will be available in the first half of 1996.
- A series of Transcend network management applications that allow uses to monitor and control all these new devices will also be rolled out over the next six months.

"We see fast Ethernet as an excellent technology to build high-performance workgroups, server farms and uplinks to core networking devices such as routers and switching hubs," said Kevin Mullenex, director of business development for 3Com. "The rollout provides some key pieces of our architecture, which is our scalable net infrastructure encompassing an entire suite of technologies."

According to Le Baron, 3Com is on the right track. "We expect this market to really take off by the second quarter of next year when numerous vendors will have a range of fast Ethernet products available," she said. "If the prices are low enough, adoption of the technology will be more a question of why not instead of why."

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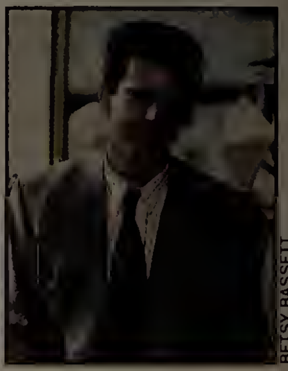
Agile

Continued from page 19

adds and changes that occur, I'm consuming many man-hours reconfiguring hosts. ATMizer will simplify that by automatically updating the net when something changes and help me avoid breaking the net into more subnets."


BETSY BASSETT

VON LICHTENBERG

Tim Kuhfuss, manager of networking at Argonne National Laboratories in Chicago, will use ATMizer as a multimedia feeder node.

"We need a way to give our Ethernet users access to resources on our high-speed networks such as ATM," he said. "ATMizer will help us offer seamless support of multimedia streams down to the desktop with low latency, high bandwidth and a price we can live with," Kuhfuss added.

All products will be available in the fourth quarter. ATMizer pricing begins at $36,000, which includes 12 Ethernet switch ports, two ATM ports and a single power supply. ATM port modules cost $2,500, as does an additional power supply. ATMman costs $5,000.

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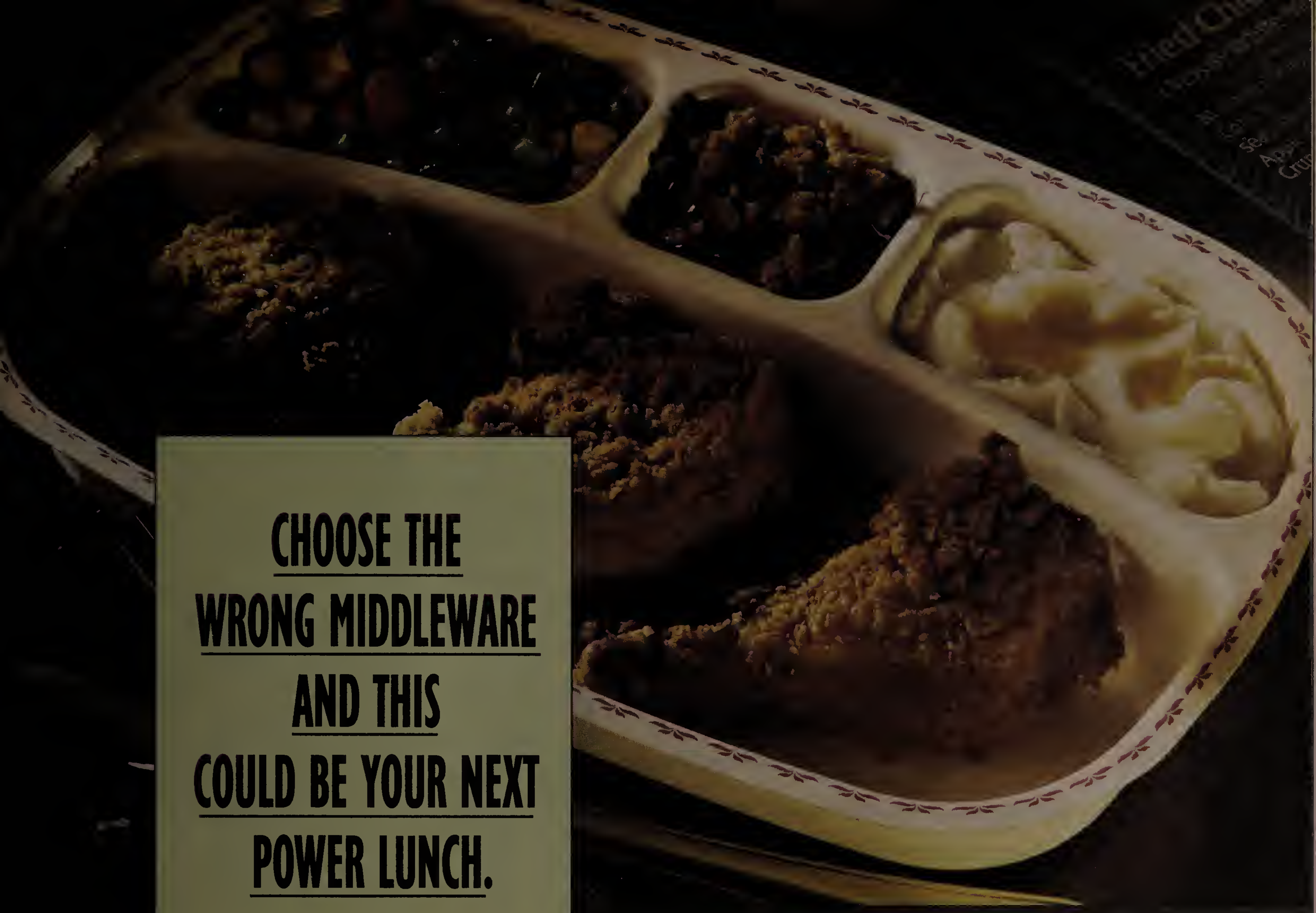

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the way this

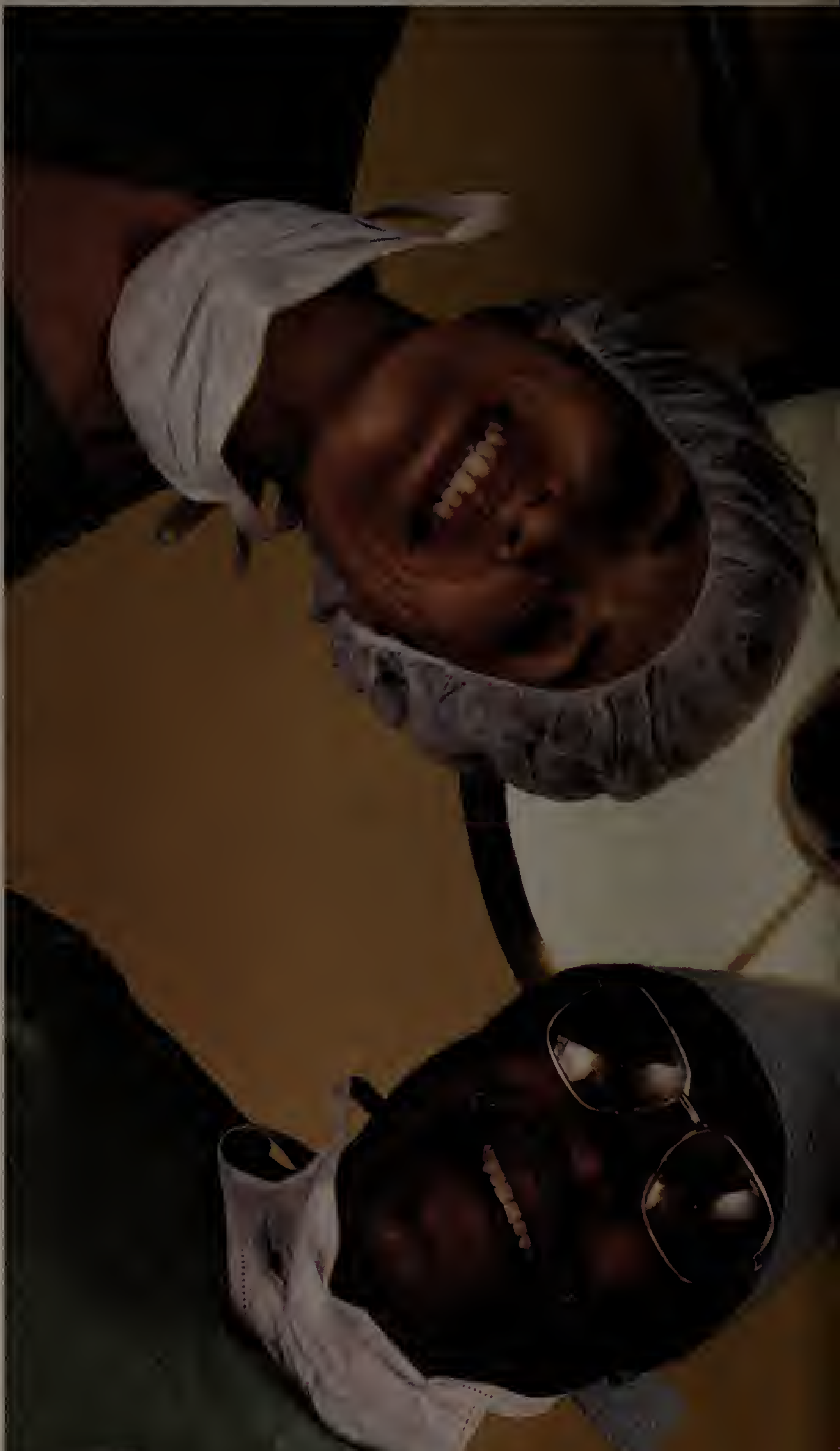
SUPER STACK

When you have 167,000 patients to care for, an unreliable network can leave you in critical condition. That's why the Georgia region of Kaiser Permanente, one of the country's largest HMOs, chose an innovative system to internetwork its outpatient facilities. It's 3Com's Boundary Routing system architecture.

With 3Com's Boundary Routing technology in place, personnel at Kaiser Permanente's outlying medical facilities in Georgia now have access to their nationwide network, and important patient information.

And, since the entire Georgia network is managed and maintained from their regional offices in Atlanta, there is no need for network managers at outlying sites.

The result is a system capable of permitting members to call any Kaiser Permanente location to get lab test results or schedule appointments. What once required manually making appointments and tracking down lab reports can now be done on-screen in a matter of seconds.



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Routing™ changed
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"Kaiser Permanente has an ongoing commitment to superior patient service. With 3Com's Boundary Routing technology, we're able to serve our members with the highest level of quality, and ourselves with a simple, cost-effective solution," says Amin Tejani, Kaiser Permanente Information Systems Analyst. "Plus, our medical offices require no network support staff."

With 3Com's Boundary Routing technology, Kaiser Permanente can enjoy all the benefits of remote office routing without the complexity.

HMOs aren't the only ones operating with the simplest and most cost-effective internetworking system. For a free video, *Plug and Play Remote Networking,* along with complete product information, call **1-800-NET-3Com**. Boundary Routing, the prescription for any network.

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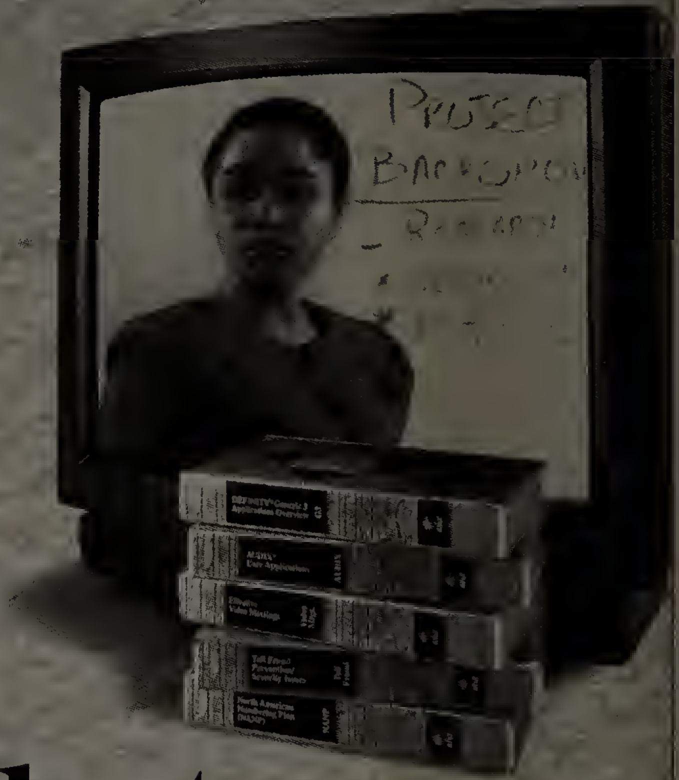

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GLOBAL SERVICES

Voice, Data and Wireless Services, Regulatory Issues and Voice CPE

Falling-out between MCI, Nextel could stunt digital airwave growth

BY DAVID ROHDE
AND JOANIE WEXLER

Washington, D.C.

Companies looking to soon implement broadband wireless applications can keep right on biting their fingernails.

Last week, MCI Communications Corp. nixed its February agreement to invest $1.3 billion for a 17% stake in wireless net operator Nextel Communications, Inc. This means MCI is back at the drawing board resketching its plan for delivering nationwide, digital wireless services.

Meanwhile, down the street, the Federal Communications Commission outlined the harsh realities of how long the personal communications services (PCS) bidding and award process would take.

Neither event bodes well for users ready for broadband services. For example, MCI's deal with specialized mobile radio (SMR) operator Nextel was the cornerstone of its strategy aimed at delivering sophisticated wireless voice and data services to early adopters sooner than PCS auction bidders could.

MCI-Nextel's leg up was that the companies — along with partners Comcast Corp. and Motorola, Inc., which provides Nextel's digital infrastructure technology — only need to upgrade Nextel's existing nationwide analog SMR network to digital.

This means they would not have to wait for the federal spectrum auction late this year to begin building an infrastructure from scratch.

But the two firms terminated the agreement for reasons analysts have deemed technical and financial — to the disappointment of some users.

"We're in the class of users needing PCS-like technology sooner rather than later," said Githesh Ramamurthy, executive vice president of product engineering at CCC Information Services, Inc., a networking and information systems firm serving the insurance claims industry.

While advances are being made for making some applications friendlier to today's low-speed wireless links (see story, this page), "we need broadband access now because we're really pumping data," he said.

Reported problems with call quality in Nextel's early digital infrastructure in Los Angeles turned MCI

See **Falling-out**, *page 32*

The long and winding road to PCS

Now	Bidders begin submitting application forms and up-front payments.
Early to mid-fall	FCC issues Public Notice, listing bidders and their proposed applications.
75-90 days later	First auction of 99 30-MHz licenses begins.
6-8 weeks later	First auction ends.
Next 10 days	Winners submit deposits and "long forms," proving financial capability.
Next 40 days	Losers get a chance to challenge qualification of the winners.
Next 5 days	Barring challenges, winners receive the license and begin build-out.
Late spring 1995	Auction of approximately 1,000 30-MHz and 10-MHz licenses in "entrepreneur's blocks" begins.
Later in 1995	Auction of approximately 1,000 remaining 10-MHz licenses begins.

GRAPHIC BY TERRI MITCHELL

BRIEFS

Five big newspaper companies have urged the **Federal Communications Commission** to authorize the use of three-digit **N11 numbers** — those beginning with 2 through 9 and ending with 11 — for paid information services. For example, a service jointly run by the *Atlanta Journal* and *Constitution* is averaging 86,000 calls per month, with less than .08% of the customers complaining and receiving a refund. FCC action is needed because all the regional Bell holding companies, except BellSouth Corp., are resisting the idea, according to the companies. The other firms involved are Gannett Co., The Washington Post Co., Hearst Corp. and Advance Publications, Inc.

U.S. District Judge Harold Greene has given the nod to **AT&T**'s proposed acquisition of **McCaw Cellular Communications, Inc.** Greene gave AT&T a limited waiver of the court's antitrust rulings, allowing AT&T to acquire the portions of McCaw owned by the regional Bell holding companies. AT&T needed the waiver because the Consent Decree governing its breakup with the Bells a decade ago precludes the carrier from owning any part of them. The **Federal Communications Commission** still must make a ruling before the acquisition, set for next month, can go through.

Meanwhile, McCaw has entered the paging business through reseller agreements with such companies as **BellSouth Corp.**'s paging subsidiary, **MobileComm, Paging Network, Inc.** and **SkyTel.** McCaw can now provide paging services alongside its cellular services.

MOBILE MARKET

Oracle tools may kick-start user moves to wireless services

BY JOANIE WEXLER

Wireless services could soon get a shot in the arm from database giant Oracle Corp., which is preparing to team with radio net operators, such as RAM Mobile Data, to sell application development tools and other products that promote more efficient use of bottlenecked air links.

Oracle, which analysts said owns about 55% of the U.S. database market, has reportedly created a set of products that will let mobile workers efficiently access existing databases. The products will require no alteration to existing database servers and minimal application development for Windows-based laptops, said sources close to the company.

The products and joint sales relationship with RAM Mobile will be announced at the NetWorld+Interop 94 show next week in Atlanta, and the two companies will reportedly begin selling them early next year.

PREVIEW
NETWORLD+INTEROP 94

Oracle is also reportedly working to strike similar joint arrangements with ARDIS Co., McCaw Cellular Communications, Inc. and others.

The products include an intelligent agent-based messaging gateway running on a Unix workstation that front-ends the database server. On the WAN side, the gateway will support wired links to a variety of services, such as X.25 connections to RAM Mobile, frame relay to Cellular Digital Packet Data nets and modem banks for connecting to circuit-switched cellular nets.

See **Wireless**, *page 32*

Fruit of Sprint-3Com deal: flexible remote access solutions

BY DAVID ROHDE

Santa Clara, Calif.

Sprint Corp. is preparing to offer flexible remote access products to its managed network customers through an alliance with bridge and router maker 3Com Corp.

The arrangement — discussed privately by Sprint officials for several months and confirmed last week by 3Com officials here — is expected to be announced later this month.

The Sprint deal would add another feather to 3Com's cap in its effort to cut deals with carriers that are deepening their customer relationships by pushing into LAN and WAN configuration and monitoring.

Just last week, for example, US WEST, Inc. announced that it will offer 3Com's AccessBuilder remote access server to customers of its Interprise Networking Services division.

For US WEST's Interprise group — the acknowledged leader among regional Bell holding company network integration units — the 3Com selection was a departure from its heavy reliance on Cisco Systems, Inc. networking equipment.

The flexibility of the AccessBuilder — which allows home and mobile users to use analog phone lines or switched digital lines, including ISDN — figured heavily in US WEST's decision (see graphic).

And so did management and security features recently added to the AccessBuilder. For example, during a dial-up connection, the AccessBuilder can temporarily assign IP addresses from a limited pool after authenticating the user through a security software agent (*NW*, April 18, page 17).

Not only does the AccessBuilder enable users to extend their networks to telecommuters and mobile sales forces, it also opens up links with suppliers and customers, said Berge Ayvazian, senior vice president with The Yankee Group in Boston.

"What the carriers are doing is creating easy-to-adopt methods that customers can easily add on to their existing application platforms," Ayvazian said.

For example, Interprise's frame relay customers could install an AccessBuilder on their corporate LANs to allow simple dial-up access by remote users, said Erika Reum, remote access product-line manager for US WEST. Alternatively, an AccessBuilder could sit at a remote office and become a frame relay node through attachment of a frame relay access device.

Sprint's support of 3Com equipment will probably include not only AccessBuilder, but also other products such as 3Com's NetBuilder branch office routers, said David Helfrich, vice president of marketing at 3Com. Sprint's May launch of its Managed Network Services involved key router models from Cisco and Wellfleet Communications, Inc.

Other carriers are negotiating with 3Com for remote access solutions in what is likely to be a snowball effect, Helfrich said.

Jeff Kaplan, a director in the Framingham, Mass., office of market research firm Dataquest, Inc., agreed that other carriers will copy these moves. "They take cues from one another as far as who is the best of breed," he said.

Remote access: courtesy of the phone company

By offering 3Com Corp.'s AccessBuilder, US WEST can offer LAN users:

- Scalable support for up to 16 concurrent dial-up connections.
- Dynamic bandwidth allocation.
- Support for analog modem connections, switched 56K bit/sec and ISDN links.
- Multiprotocol client-to-LAN and LAN-to-LAN bridging and routing.
- Centralized SNMP-based management.

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Integrated Networking Interface	32-bit	16-bit		
Integrated, multiprotocol Boot-ROM	X	X		
ISA Plug-n-Play Compliant	X	X	X	
Multilevel Security Features	X	X	X	X
Asset tracking	X	X	X	
PC tattooing	X	X	X	
Optional Desktop Management Software	X	X		
Bi-directional parallel port	X	X	X	X
Desktop Management Interface (DMI)[3]	X	X		

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HP Vectra N2

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AT&T-Delta venture might have piggybackers flying high

BY JOANIE WEXLER

The outsourcing joint venture formed by AT&T and Delta Air Lines, Inc. to slash airline's operational costs could eventually strengthen the bottom lines of other companies willing to piggyback on Delta servers and private fiber links.

Delta's Ronald Allen (l.) and AT&T's Robert Allen hope to move Delta and others "into the next century."

AT&T and Delta late last month announced the creation of a joint company, to be headquartered in Atlanta, comprising Delta's 1,200 information systems staff and 30 AT&T Global Information Solutions personnel.

Delta plans to spend $2.8 billion in equipment and services from AT&T in the next 10 years, during which it anticipates $400 million in savings.

The venture will provide system design, network support, operational software and other offerings to Delta and others in the transportation industry when it opens its doors late this year, AT&T and Delta said.

John King, Delta's vice president of information technology, said the airline has determined there is an economic advantage to running a private frame relay network to support certain high-traffic segments of its net, such as among large airports. The network could save the airline up to 25% in recurring service and usage costs, he added.

Delta will probably allow others in the industry to hitch rides on its fiber and share its computing resources as a money-saving move, King said.

The frame relay net is part of Delta's migration to a client/server infrastructure.

For links among medium and small airports, ticket offices and sales offices, Delta might turn to virtual AT&T frame relay service, which King said is more cost-effective in lighter load locations.

CREATIVE DOWNSIZING

For Delta, the joint venture is a creative way to simultaneously downsize and placate shareholders by diversifying with a minimum of investment, analysts said. The 1,200 professionals who will transfer to the as-yet unnamed joint venture will count toward a 12,000- to 15,000-employee reduction announced in April, said Delta Chairman Ronald Allen.

The venture's first project will be to reengineer Delta's business based on client/server technology to "move us into the next century," according to Allen.

AT&T's Dayton, Ohio-based Global Information Solutions will take the lead role in representing AT&T in the 50-50 joint venture, said AT&T Chairman Robert Allen.

Fred McClimans, principal of Decisis, Inc., a consultancy in Herndon, Va., said while he would not expect Delta's direct competitors to use the venture's services, "smaller, regional airlines would be likely to sign on for Delta's large base of technology expertise."

The deal does not cover Delta's reservation system, which is run by Worldspan, Delta's venture with Trans World Airlines, Inc. and Northwest Airlines, Inc. The AT&T-Delta company would not be likely to offer reservation services to others, according to a Delta spokeswoman.

Wireless

Continued from page 29

The agent in the gateway will do the communicating with the server, taking advantage of fast local links to unbundle multiple SQL statements sent in a single message from the client. This pares down the bandwidth-gobbling multiple round-trips today's applications make to talk to corporate databases.

If the server was required to change, the ramp-up period for wireless networking could take customers several years.

A client piece of the software for laptops buries the wireless interfaces from the developer and reportedly will reduce the development time for wireless applications from months or years to weeks, according to a source within Oracle.

"I think a ready-made front end will get a lot more people to look at wireless," said a net specialist at a large Chicago bank. "You have a single vendor for problems and can bring up your application that much faster."

The person wondered, though, about the need for a standard application program interface (API) for wireless client development. "Without one, you're locked into Oracle," he said. "I give the industry about 15 msec to create a new API consortium."

Currently, with the RAM Mobile net, users buy standard development tools and essentially mimic wire-line applications over the air link, said Ed Collyer, RAM Mobile's director of network product management.

Developers must deal with the complexity of radio links and write applications that assume a very high performance connection — an assumption that inevitably results in poor performance, he said.

Oracle reportedly kicked off its wireless-aware development efforts with RAM Mobile because of RAM Mobile's adherence to the worldwide Mobitex radio standard, which Collyer said promotes portability of applications to nets in different countries.

Radio service providers will also gain the leverage of Oracle's worldwide sales force to educate users about wireless applications. Oracle, which confirmed the product and sales plans but refused to give details on pricing and product names, said it has 8,000 salespeople worldwide.

Mid-tier courier leaves its door open to wireless options

BY JOANIE WEXLER

Raleigh, N.C.

A trucking firm installing a wireless net to increase loading dock productivity and reduce damage claims is hedging its bets with a gateway that leaves the door open to the string of emerging wireless technologies.

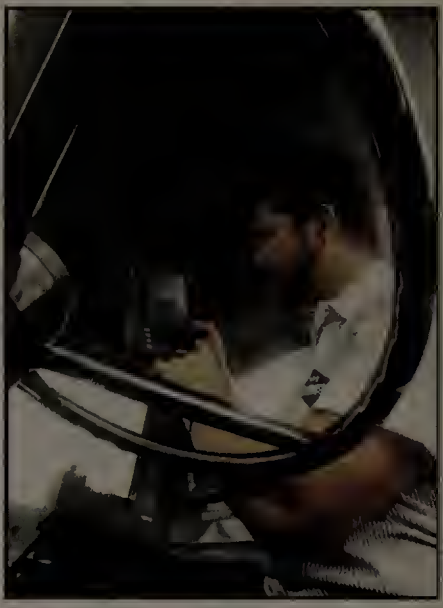
Overnite Transportation Co. has kicked off a specialized mobile radio (SMR) data application pilot for its local pickup and delivery truckers here. Overnite is a mid-range courier that last week increased its wireless test bed from five to 12 trucks and plans to have all of its 45 drivers here on the system in a month.

The pilot represents Phase 1 of a plan to outfit dispatchers in Overnite's nearly 200 coast-to-coast service centers and 3,300 local pickup and delivery trucks with similar mobile communications capabilities.

But depending on which wireless transport technologies survive, which are best tuned to future applications and which are priced compellingly, Overnite wants the freedom to mix and match the SMR net with other air links, said Ted Beason, a project manager for NiteTrack, Overnite's budding service center automation program.

For now, Overnite is counting on a Racotek, Inc. wireless gateway as its insurance policy.

Racotek makes a LAN gateway that connects applications to a variety of wireless networks; in addition, the Minneapolis-based company serves as a systems integrator for wireless services, as well as in-vehicle and hand-held devices.



BOB GOLDBERG

Efficient logistics planning via wireless should minimize package handling and reduce potential damage claims at Overnite.

Overnite is starting with the SMR interface but could turn to emerging Cellular Digital Packet Data, enhanced SMR, personal communications services and other technologies as they unfold, Beason said.

"We wanted to get our feet wet with mobile data, but there seems to be so much confusion as to what will be available and when," he said.

According to Beason, his company is not optimistic that there will be one wireless net that meets its needs in terms of coverage, seamless roaming and cost.

For now, the company has begun using a mobile data application written by Industrial Computer Systems, Inc. in Evergreen, Colo., which interfaces to Racotek's RacoNet operating system. Dispatchers in one of Overnite's service centers here can track via PC where drivers are, the size and weight of the items they are carrying, as well as other information, to best determine who they should dispatch where.

Until now, dispatchers and drivers communicated over the Motorola, Inc. SMR net by voice. "Once drivers were on the street with a load, there was no real information about shipments until they returned, handed in the paperwork and the data got keyed into the mainframe," Beason said.

This made it difficult to efficiently plan loading dock use, he said, by making sure a truck's cargo arrives at or near the door where the load will ultimately be shipped out again with others bound for the same destination. Beason said the wireless goal is to enable that scenario, thus reducing potential claims by minimizing package handling.

Drivers use a Norand Corp. Pen Key handheld 386-based portable computer with a touchscreen interface and a numeric 10-key keypad to communicate with Motorola radios and modems in their trucks. The modems communicate with the Racotek gateway, which sits on the service center's Novell, Inc. LAN.

Dispatchers hooked to the LAN use the data immediately for making logistics decisions. Meanwhile, the LAN server sends the input to the corporate mainframe to make the trucking activity data available across service centers.

Falling-out

Continued from page 29

off, said Ann Lynch, senior market analyst at BIS Strategic Decisions, a consultancy in Norwell, Mass. "MCI wants to keep its reputation as a quality innovator," she added.

Others said the partnership faltered because Motorola's recent sale of its SMR licenses to Nextel in return for Nextel stock rendered Motorola a larger shareholder than MCI.

MCI spokesman Kevin Inda said MCI is still committed to providing a nationwide wireless service, but the door is open as to whether Nextel, other partnerships or acquisitions, PCS spectrum or a combination will be its vehicle.

For those in a hurry, broadband PCS probably won't fit the bill, either.

Aside from the unresolved state of PCS standards (*NW*, Aug. 29, page 28), FCC officials told a packed auditorium of several hundred potential PCS bidders here last week that the first auction may takeup to eight weeks to complete. By contrast, the first narrowband PCS auction for advanced paging and voice services was completed in less than a week (*NW*, Aug. 1, page 4).

The FCC also faces a number of other timing hurdles in getting the PCS licenses awarded (see graphic, page 29), such as challenges to its PCS awards, which are allowed within 40 days of the auction.

The commission is trying to avoid bid challenges based on winners' financial eligibility by setting a very high ante for the 2GHz-range PCS spectrum. For example, a bidder for 30-MHz licenses in an area with 28 million potential customers would have to pony up $16.8 million before the bidding begins.

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RATE & TARIFF MONITOR

by Eric Paulak

I'm not going to tell you how much it costs

How easy would it be to go shopping for a car if there were no sticker prices and the dealer wouldn't tell you the asking price unless you promised to buy the car?

Not very, and you probably wouldn't stand for it.

But that's exactly what goes on every day in the long-distance market with so-called value-added data services.

The FCC manages to define these services to include everything from basic X.25 packet switching to SMDS, ATM and even frame relay — the fastest growing services and revenue sources for the carriers.

Here's the story. Any inter-LATA service that is classified as value-added (a.k.a. enhanced) doesn't have to be tariffed. The FCC says value-added means that the transmission signal has been processed in some way.

Signal processing is used on services such as dial-up banking or E-mail. It also includes error correcting, encoding and decoding — essential switched data service features.

So if you want to take advantage of switched data services rather than costly private lines, you have to use a value-added network, and you're left with no sticker price.

There is, however, some hope in this picture. MCI doesn't file tariffs on its value-added services, but it does provide rate sheets. And, for the most part, those are the prices the company sticks with.

With SMDS, for example, MCI (the only interexchange carrier offering the service) announced prices last month. The rates are based on two components: port/subscription charges and usage.

For MCI, SMDS that is passed on from a local exchange carrier's (LEC) SMDS net, port charges range from $50 per month for a 64K bit/sec DS0 circuit to $3,250 for a 34M bit/sec circuit.

MCI's transport charges are mileage- and speed-sensitive, and are assessed on a per-megabyte transmitted basis. For a 200-mile transmission with a port speed under 1.54M bit/sec, it costs $.0169 per megabyte. And for the same 200-mile transmission with a port speed greater that 1.54M bit/sec, it's $.0135 per megabyte.

If and when AT&T and Sprint offer SMDS, they will probably charge in the same ballpark. But since they don't file tariffs or provide rate sheets, there's no way of telling unless you get a bid from either one.

Even if AT&T and Sprint did provide rate sheets, it wouldn't guarantee that the price listed is what you would pay. Because the services aren't tariffed, the carriers can raise or lower the rates whenever they want.

And to make matters more confusing, even though the FCC doesn't require the long-distance carriers to file tariffs for their inter-LATA, interstate value-added services, the FCC requires LECs to file inter-LATA access tariffs on the same services.

What's the solution to this mess?

You don't want to discount these new switched data services because user experience has shown that they save money over traditional private lines. At the same time, it would be nice to able to make an informed decision.

To do so, you have three options.

First, you could try to get your value-added services tariffed. The problem with this is that only the FCC can require the tariffs, and it shows no indication of adding new tariff requirements. In fact, the commission is trying to get rid of some tariffs it now gets.

Your second option is to get AT&T and Sprint to provide rate sheets. Then again, without a tariff to back it up, a rate sheet doesn't guarantee anything.

That leaves one option: putting the services up for bid. It'll take more time, but if you want to ensure that you're getting the best deal, it's the only option available.

➾ Paulak is associate publisher at the Center for Communications Management Information in Rockville, Md., a provider of rate and tariff information. He can be reached at (301) 816-8950, Ext. 327.

NETWORK WORLD TECHNICAL SEMINARS

The world of global networking, often referred to as Cyberspace, is under construction. The Internet, one of the primary building blocks on the road to cyberspace communication, offers companies of all sizes, in all markets, the opportunity to stake a claim in the globally networked future.

In both senses of capitalizing — taking advantage of and profiting from — the Internet provides the landscape for businesses to improve current practices and establish new markets. Organizational needs and necessities such as research, technical support and services, marketing and publishing can all be done on the Internet.

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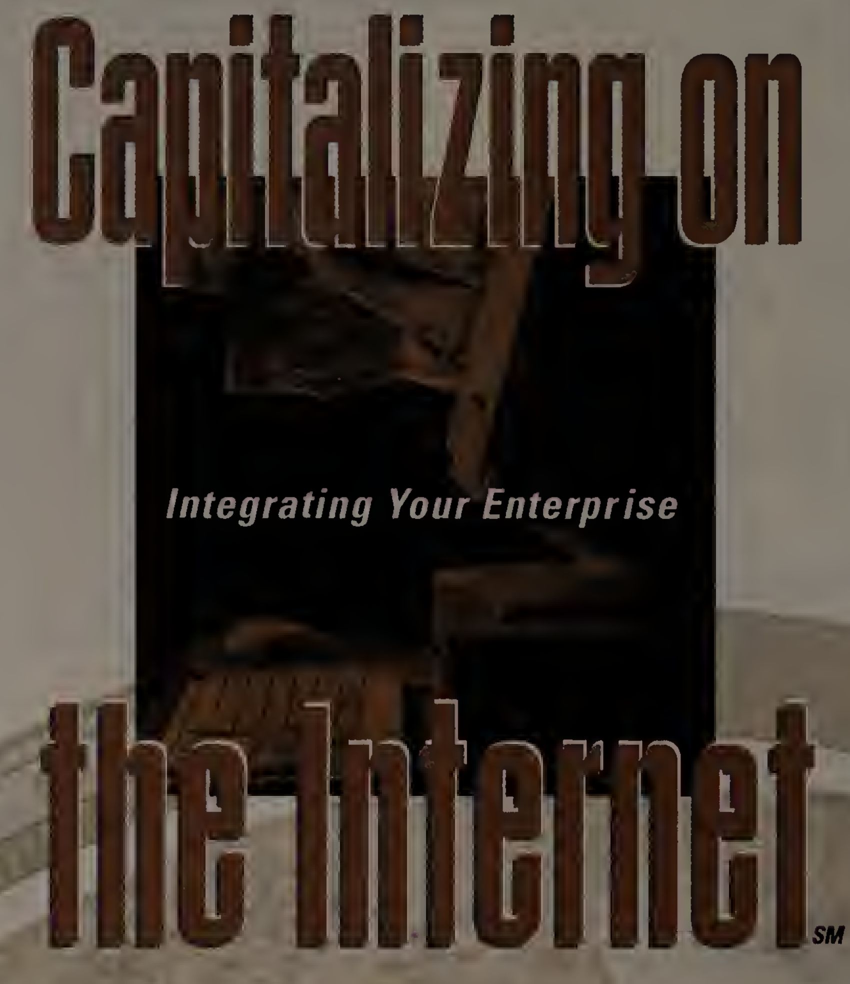

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CLIENT/SERVER APPLICATIONS

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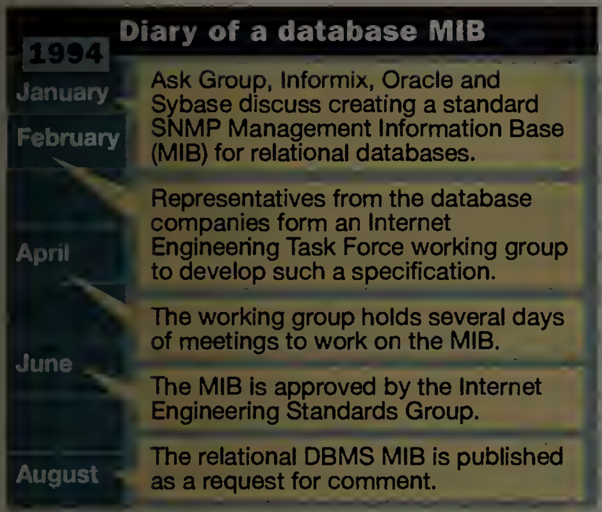


Ask Group, Informix, Oracle and Sybase discuss creating a standard SNMP Management Information Base (MIB) for relational databases.

Representatives from the database companies form an Internet Engineering Task Force working group to develop such a specification.

The working group holds several days of meetings to work on the MIB.

The MIB is approved by the Internet Engineering Standards Group.

The relational DBMS MIB is published as a request for comment.

SNMP-based database mgmt. nears reality

BY BARB COLE

Last month, representatives from some of the top database companies published a specification for monitoring their products via Simple Network Management Protocol-based management systems.

Members of the Internet Engineering Task Force working group that developed the specification, officially known as RFC 1697, said vendor-specific implementations of the relational database management system (DBMS) Management Information Base (MIB) may appear as soon as the first quarter of 1995.

These implementations, also called subagents, are needed because the relational DBMS MIB defines more than 50 areas to be tracked via SNMP, but does not address features unique to particular databases.

"We agreed on a small but reasonably useful set of objects to be tracked," said Anthony Daniel, a member of the working group and systems management architect at database vendor Informix Software, Inc.

The relational DBMS MIB defines what Daniel described as a specification for first-tier monitoring of databases via SNMP. It is not designed to turn system or network managers into database administrators, but will provide an early warning of problems, he said.

"The focus has been on monitoring" Daniel said. "If you look at a typical MIS department, it wants to get a first warning about database problems through its main management system.

The vendor-specific subagents based on the relational DBMS MIB will let systems managers collect useful statistics on database usage and determine if the databases are running smoothly.

The relational DBMS MIB will let users track throughput, configuration, number of database connects and number of I/O writes, among other things. The MIB will be deployed on database servers being managed.

"Say you have a system that normally has 100 users, and now only five are connected. That's the kind of thing you'd be alerted of," Daniel said.

Managing databases across networks has become increasingly important as companies downsize large databases and distribute them throughout the enterprise. In addition to the SNMP MIB, several database vendors plan to build their own management tools

See SNMP, *page 39*

'Channels' surfing across the groupware seascape

Team Software's Doherty helps define the market.

Q&A Team Software, Inc. is one of a new breed of collaborative computing application vendors nipping at the heels of groupware market leader Lotus Development Corp. *Network World* Senior Writer Adam Gaffin recently spoke to Team Software President Sean Doherty about Team Software's Channels real-time conferencing software and the market at large.

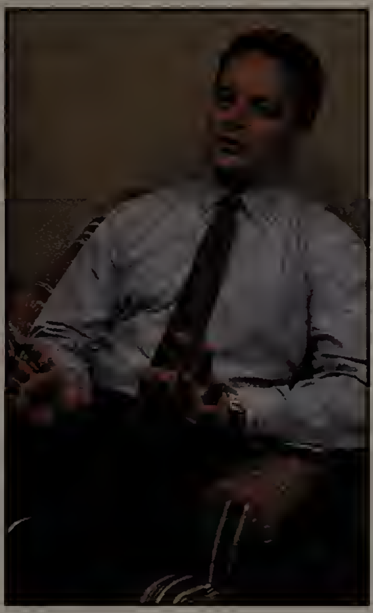
How does Channels stack up against some of the other emerging conferencing products, such as Collabra Software, Inc.'s CollabraShare?

There's one fundamental difference at the top level between our software and most of the others, and that's this [remote procedure call]-based connection that we have between our client and server. The bottom line for end users and LAN administrators is that the Channels software can run on a wide-area network as a single system and runs much better than other conferencing packages on a local-area network because of this architecture.

Everybody knows that the shared-file systems upon which most of these conferencing products are based are highly dependent on constantly polling a central file system to see if there are any new messages. That creates a lot of [scalability] problems. With a product like ours, as these new postings to a discussion forum are pushed from the server out to the client, it lets us scale this product really easily on a LAN or WAN.

Where do you see the groupware market heading?

As the market matures, you're going to see groupware as a category really break up into groupware capabilities that are added onto existing products as well as stand-alone categories, perhaps communications groupware or database-oriented groupware. The category we are trying to promote is the communications-oriented groupware. Our products are all about improving communications among users spread across a LAN or a WAN, the kinds of communications that now might go through other channels, such as fax machines or telephones.



"If you're talking about groupware as a category, I don't think you need to have everything in the same box."

As users begin to look at ways to leverage their communications networks, won't they look to integrate additional services such as back-end databases? And if that's the case, how do you provide that?

If you're talking about groupware as a category, I don't think you need to have everything in the same box. That's like saying I need to have data access through my telephone. Spreadsheets are good for numbers, but aren't particularly good for presentation, I think products like Channels are extremely useful for workgroup communications, but I think the management of data is best left to, if you will, groupware-enabled database applications.

There's been a lot of talk about the concept of a universal in-box that collects all sorts of messages. Is this needed, and how does Channels fit into this scene?

In the short term, for management of what we all think of about as E-mail, I think that's really important. In talking to many of our clients, they have a lot of difficulties with jumping around between E-mail systems. It's a real dilemma for them to integrate all of these E-mail systems and have the information that they need to get relatively quickly. Right from the start, we've supported [Microsoft Corp.'s Messaging Application Programming Interface and the Lotus Development Corp.-based Vendor Independent Messaging specifications].

In the longer term, I think this universal

See Groupware, *page 38*

BRIEFS

As expected, **Novell, Inc.** said last week that it would add support to its **Tuxedo** transaction processing monitor for a new version of the Open Software Foundation, Inc.'s Distributed Computing Environment (DCE). The company said it would work to integrate Tuxedo more tightly with DCE's directory and security services when DCE 1.1 is released in November.

Novell also announced plans last week to link Tuxedo with the existing version of DCE, which will let Tuxedo and DCE applications interoperate via application program interfaces.

Lotus Development Corp. last week said it began shipping its Pager Gateway for **cc:Mail.** The software lets cc:Mail users send messages of as many as 240 characters to a variety of alphanumeric pagers and paging networks. The software can reside on the same platform as a cc:Mail router or be run on a dedicated DOS or OS/2 server. The gateway can be accessed by all cc:Mail clients.

Pricing starts at $995 per license.

Lotus: (800) 448-2500.

PostModern Computing Technologies, Inc. of Mountain View, Calif., last week announced plans to support additional platforms with its ORBeline **object request broker (ORB).** By October, the company expects to begin shipping ORBs for several operating systems, including Hewlett-Packard Co. HP-UX, Novell, Inc. UnixWare and IBM OS/2.

This is in addition to the Cray Research, Inc. Cray XMP, SunSoft, Inc. SunOS and Solaris, Digital Equipment Corp. OSF/1, and Microsoft Corp. Windows and Windows NT operating systems already supported.

ORBeline costs between $995 and $7,995, depending on the platform.

PostModern: (415) 967-6169.

Prodea Software Corp. of Eden Prairie, Minn., released last week a version of its ProdeaSynergy process automation tool tailored to Microsoft Corp.'s Microsoft Office application suite. ProdeaSynergy is a graphic tool that lets users automate tasks using several desktop applications and electronic mail.

Prodea: (800) 427-2317.

NetWise, Inc. of Boulder, Colo., last week announced a new **middleware** application for linking Windows to host and server databases. TransAccess Application/ Integrator Workbench allows a developer to generate programming code for a variety of development tool kits via a graphical interface.

For example, a developer could automatically generate client code for Powersoft Corp.'s Powerbuilder and for a mainframe-based Cobol application.

The software supports IPX/SPX and TCP/IP for Windows and DOS clients, and Systems Network Architecture for OS/2 clients. It also supports IBM MVS, several versions of Unix and Digital Equipment Corp. VMS.

Pricing starts at $600 per license.

NetWise: (303) 442-8280.

These days, all it takes is a little success to overload your business. The more you demand of your computers, the slower things can get. Well, that's because PCs are made to be PCs. And at this point, what you really need is a server—the most efficient way to get your PCs working together.

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Dynasty and HP sharpen their development tools

BY ADAM GAFFIN

Naperville, Ill.

Dynasty Technologies, Inc. last week announced plans to widen the number of applications, operating systems and back-end services supported by its application development tool set.

Among the enhancements in the Dynasty Development Environment 2.0 are support for the Open Software Foundation, Inc.'s Distributed Computing Environment (DCE), Novell, Inc.'s Tuxedo transaction monitor and database, stored procedures, and triggers.

The software, to ship by first-quarter 1995, also adds support for Windows and OS/2 TCP/IP sockets.

New databases supported by the software are Oracle Corp. Oracle7.X and IBM DB2/2. It also supports Sybase, Inc.'s client tools. Previously, the software supported Oracle6.X, Gupta Corp. SQLBase and Microsoft Corp. SQL Server databases, as well as Microsoft Corp.'s Open Database Connectivity specification.

Dynasty officials said the enhancements will bolster the software's ability to build cross-platform applications for enterprise nets. The product already supports application partitioning among clients and servers, a three-tier architecture, and integration with several types of middleware.

Dynasty also redesigned the tool's graphical interface, adding such features as drag and drop and a notebook metaphor that lets users "flip" from section to section. The developers software resides on Windows platforms, with links to a server-based repository that lets teams of developers share objects.

The software supports Windows, OS/2, Macintosh, OpenLook and Motif clients.

Pricing starts at $8,000 per developer, which enables development of applications for one operating system. Modules for additional operating systems cost from $12,000 to $22,000 per developer.

Development toolbox

Dynasty Development Environment 2.0 adds support for:

- Stored procedures.
- Nonrelational databases.
- Windows and OS/2 communications sockets.
- The Tuxedo transaction processing monitor.
- Distributed Computing Environment.

Hewlett-Packard SoftBench 4.0 adds:

- Graphical performance analysis.
- Links to OODCE/9000 DCE development tool.

HP ADDS VITAMIN C

Meanwhile, Hewlett-Packard Co. announced a series of enhancements to its SoftBench tools for building applications in C, C++ and COBOL.

Additions to the C and C++ versions of SoftBench include graphical and static analysis tools, and links to HP's Object-Oriented DCE/9000 for linking object-oriented applications and DCE. The C++ version adds integration of three COBOL development tools.

SoftBench 4.0 for HP-UX is available now, with a Solaris version expected in October.

Pricing ranges from $2,395 and $7,995, a reduction of up to 35% of previous prices.

©Dynasty: (708) 355-8300; HP (800) 752-0900.

BUSINESS APPLICATIONS

D&B Software extends its database hooks

BY KEVIN FOGARTY

Atlanta

Dun & Bradstreet Software last week said it will port its SmartStream line of workflow-enabled business applications to Oracle Corp. databases, and possibly others, over the next two years.

Follow UP

As expected, the company announced an agreement with Oracle to port the D&B Software client/server applications to the Oracle7 database (*NW*, Aug. 29, page 8). The firms also agreed to complete in November a five-month benchmarking project to outline the technical requirements of porting SmartStream to other databases.

SmartStream is extremely difficult to port from one database to another because of its heavy reliance on stored procedures specific to Sybase, Inc.'s SQL Server database, said Bobby Cameron, an analyst at market research firm Forrester Research, Inc. in Cambridge, Mass. Up to now, that has been the only database with which the applications could work.

D&B Software offers an integrated set of financial, human resources and budget applications that run on a common base of workflow code dubbed SmartStream. Both the applications and the underlying workflow engine use database programs such as triggers and stored procedures.

Rather than porting the Sybase stored procedures to Oracle databases, D&B Software will move SmartStream one step farther away from the database engine by running it on top of an "abstraction layer" of software, said Bob Cawley, senior vice president of customer solutions at D&B Software.

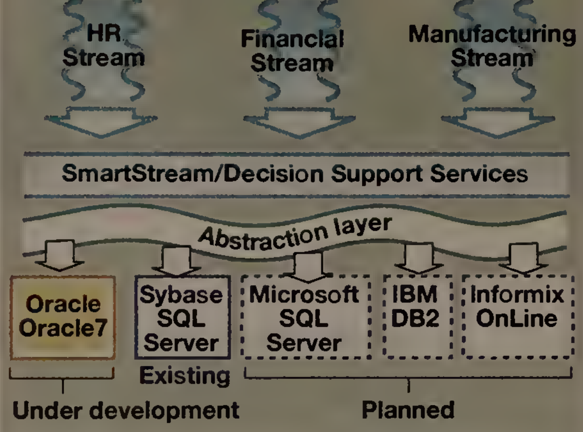
The abstraction layer would convert SQL queries from the SmartStream applications into the SQL dialect appropriate for the underlying database.

D&B Software and Oracle will work together to create the abstraction layer, relying on Oracle extraction tools to translate the Sybase stored procedures into those that can be used by databases from Oracle and other vendors.

D&B Software plans to develop drivers to access databases from IBM, Informix Software, Inc. and possibly Computer Associates International, Inc., Cawley said.

Database depth

D&B Software is adding a layer to its SmartStream workflow technology that will let the firm's client/server applications work with more databases.



GRAPHIC BY SUSAN J. CHAMPENY

D&B Software is aiming to run its entire SmartStream product line on the abstraction layer within two years, but Cawley declined to provide detailed delivery dates. A SmartStream Decision Support module will be among the first to support the abstraction layer, he said.

SmartStream products will need extensive rewriting to work with multiple databases, Cameron said. ◼

Digital close to dishing Rdb database off to Oracle

Deal to give Oracle a bigger customer base.

BY BARB COLE

Redwood Shores, Calif.

Oracle Corp. has reached a preliminary agreement to buy Digital Equipment Corp.'s Rdb relational database for about $100 million, sources close to the companies said.

Analysts said the deal would have little immediate consequence for Rdb users, but that eventually Oracle would likely try to convert those users to Oracle databases.

It is not clear if Oracle would discontinue the Rdb product line any time soon. According to analysts, Rdb is a high-performance database that lacks some of the features, such as built-in replication capabilities, that exist in products from Oracle and other vendors.

"This move may be part of a push by Oracle to shift people out of legacy databases that don't seem to be going anywhere," said Judy Davis, an analyst at consultancy Patricia Seybold Group, Inc. in Boston.

Oracle recently made an offer to Computer Associates International, Inc. CA-Ingres users to credit them for money they spent on CA-Ingres if they were to purchase Oracle databases.

"It's a no-lose situation for Oracle. Over time, they can upgrade the large Rdb installed base to Oracle. In the interim, they can enjoy the long tail of maintenance revenue on Rdb," said Steve McClellan, vice president at brokerage firm Merrill Lynch & Company, Inc. in San Francisco.

Oracle does not currently offer any software to convert existing Rdb databases to Oracle.

For the financially troubled Digital, the deal provides much-needed cash.

Neither Oracle nor Digital officials would comment on the acquisition, which is expected to be announced within the next few weeks.

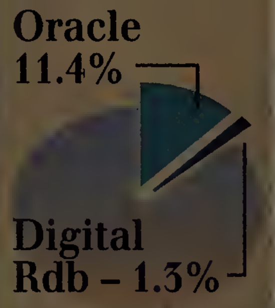
Rdb was highly successful in the 1980s but began to lose market share to products from Oracle and others that offered products based on Unix and a variety of other platforms, including Digital's VMS. Rdb only runs on VMS.

Rdb users have known for a while that the database was on the block and that it was no longer a strategic product for Digital, even though it grossed about $75 million last year. Most expressed loyalty to Digital but said that if Rdb had to go, at least it went to the market-leading database company.

"I think Rdb will still be a player in the future, and perhaps Oracle will make it even better," according to Steve Barrett, an Rdb database administrator with IKEA North America, Inc., a housewares retailer based in Plymouth Meeting, Pa.

Rdb users expressed loyalty to Digital but took heart in the fact that Oracle has a highly regarded version of its Oracle7 database for the Digital VAX. Still, most said they have no plans to switch to Oracle as long as they can continue using Rdb. ◼

Oracle last year generated $659 million in database and related revenue, while Digital's Rdb and related products accounted for $74 million in revenue. The overall database market totalled $5.3 billion in 1993.



SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

Comments?

See "Contacts" box on page 2.

Groupware

Continued from page 35

in-box is going to continue to be important, if you want to keep users from having to spend a lot of time hunting around for the information that they want, but I think the definition of what goes in the in-box is actually going to stretch the metaphor a little bit. If Microsoft, Lotus and others deliver on multimedia-enabling desktop PCs and [provide the technology for] all sorts of content [to be exchanged] among users across networks, companies like us are going to have to come up with an in-box. It will let users get at the information on their desktop or the information that they share with their workgroup quickly without worrying about using proprietary interfaces.

But if the major vendors, such as Lotus, Microsoft and Novell, are defining the interface to information, where does that leave a Channels?

They may define an interface option, but if they do what I think they're supposed to, they'll define a standard for the exchange of this information with users at the desktop or among the workgroup. So [our development group works] very hard to stay on the cutting edge of what standards are coming for the delivery or exchange of information and make our product conform to those standards. ◼

> **"[Our development group works] very hard to stay on the cutting edge of what standards are coming."**

SHOW ROUNDUP

Development tools share the spotlight

BY KEVIN FOGARTY

Washington, D.C.

A variety of client/server development tools and related offerings took center stage last week at the Client/Server Conference and Exposition here.

■ Blyth Software, Inc. of Foster City, Calif., had no new products to announce officially, but said it is working with IBM and Apple Computer, Inc. to make its Omnis 3 development tools more open. The company is currently developing links to IBM's MQSeries of message-oriented middleware, which lets otherwise incompatible applications interoperate, said Carla Schneiderman, vice president of worldwide marketing for Blyth.

The company is also considering whether to support OpenDoc, the object linking technology developed by Apple, IBM and WordPerfect, the Novell Applications Group. Blyth has a long history of support for Apple's Macintosh operating system and intends to continue that relationship, Schneiderman said.

Blyth: (800) 346-6647.

■ Itautec/America, a Dennis, Mass., subsidiary of the Brazilian Itausa company, released the Guaranteed Reliable Interoperable Processing (GRIP) development tool. GRIP is designed to integrate host-based transaction management applications with Novell, Inc. NetWare networks. The tool runs as a NetWare Loadable Module and acts as a transaction manager, pooling incoming transaction requests and passing them to a host-based transaction manager. It also monitors the transaction manager and handles recovery in case of transaction failures.

The tool costs between $4,000 and $30,000.

Itautec/America: (508) 385-8181.

■ Sometimes finding the right products for your client/server network is half the battle. Sage Associates of Stamford, Conn., thinks it can help.

The company announced that it will distribute for free an interactive CD-ROM product that will let users describe their client/server development projects graphically, then recommend products that fit the model. The catch? The disk features only vendors that have paid to be included.

Sage Associates: (203) 322-2610. ◪

SNMP

Continued from page 35

that go beyond the MIB's capabilities. Both Sybase, Inc. and Informix recently announced management tools based on Tivoli Systems, Inc.'s system management software, and Oracle Corp. is expected to roll out agents to interface with Tivoli's software, as well.

According to Daniel, the relational DBMS MIB is an important complement to those types of systems since it will allow users to do multivendor database management in a standardized way.

While most people close to the relational DBMS MIB effort feel confident about the usefulness of the MIB, analysts question the validity of using SNMP for database management.

"The idea of managing databases using SNMP is controversial in itself," said Jim Herman, a analyst at consultancy Northeast Consulting Resources, Inc. in Boston.

It's questionable whether an SNMP-based MIB will be able to provide users with enough useful information about their databases, said Tom Nolle, president of CIMI Corp., a market research firm in Voorhees, N.J. ◪

INTERNET *tip*

BY ADAM GAFFIN

One in a series of occasional tips on Internet-based information services.

New product information

The comp.newprod archives let you search for press releases and other information about new computer products released since March 1993. This Gopher resource lets you search by:

- ✓ **Company name**
- ✓ **Month**
- ✓ **Key word**

To access: Use Gopher to connect to gopher.metronet.com. Select "The comp.newprod archives" (the Uniform Resource Locator is gopher://gopher.metronet.com/11h/newprod).

Gaffin can be reached via the Internet at agaffin@world.std.com.

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EDITORIAL

It's all in IBM's hands

As SNA marks its 20th anniversary, we're posing the question: Will the venerable network architecture survive?

From my perspective, the answer lies in IBM's willingness to get aggressive at this pivotal point in the transition of corporate networks.

The conventional wisdom has users racing to ditch mainframes and embracing TCP/IP as a replacement for their traditional protocols. But the reality is that most downsizing, rightsizing, client/server – call them what you like – development efforts aren't targeted at replacing mainframe applications. In fact, most users are trying hard to bring those applications into their evolving network computing environments.

Adopting TCP/IP across the board is one answer, but IBM's Advanced Peer-to-Peer Networking may be a technically richer alternative. Customers want to see SNA evolve to meet their needs. They've had a long history of success with SNA. But they face two problems: availability and pricing.

IBM has taken such a long time rolling out key APPN functions and some important pieces, such as High Performance Routing, still aren't available. What's more, key APPN features like Dependent LU Requestor haven't been widely embraced by other vendors.

Users are also worried about the cost of implementing APPN, particularly at the desktop. As one user said: "If you look at the cost per node of doing APPN on a workstation, it's very expensive."

What's the upshot?

IBM has to drive the transition to APPN more aggressively. For one thing, it has to get more amorous with other vendors. IBM stumbled coming out of the gate with some onerous licensing conditions for APPN that chilled third-party interest. The company changed course somewhat, but it hasn't done nearly enough to get APPN running on network gear from the suppliers that control the industry.

IBM also has to give customers a real economic incentive to adopt APPN. If the company wants to retain account control, it has to make it easy for companies to make the business case for APPN. Price the technology aggressively.

In short, IBM must turn its network group loose with a mission to drive APPN into loyal customer sites. If it can do that, SNA will survive. Not as we know it today, but in a more robust, flexible incarnation.

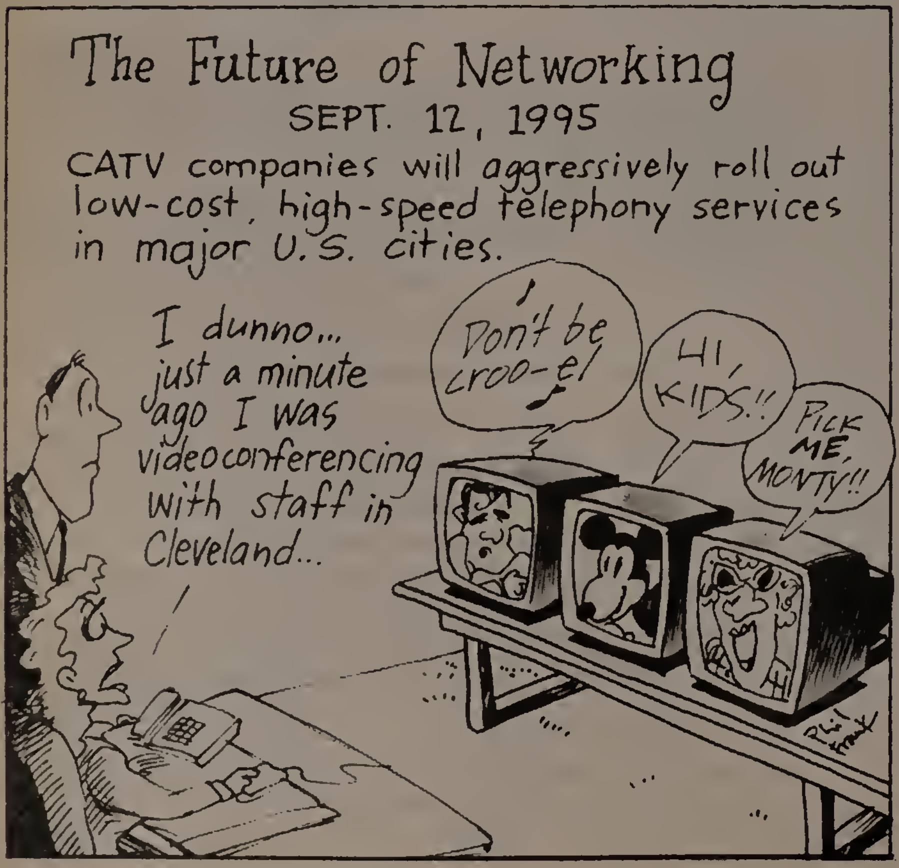
◆ ◆ ◆

On another note, take a few minutes this week to call your database vendor and ask whether the company plans to support the SQL Access Group's Transport Independent-Remote Data Access (TI-RDA) specification. TI-RDA could make it much easier to link distributed databases from multiple vendors, but suppliers say they're waiting to see whether users are interested. To find out more about TI-RDA, you can call the SQL Access Group at (603) 434-0802.

JOHN GALLANT jgallant@world.std.com

TELETOONS

FRANK AND TROISE


The Future of Networking
SEPT. 12, 1995
CATV companies will aggressively roll out low-cost, high-speed telephony services in major U.S. cities.
I dunno... just a minute ago I was videoconferencing with staff in Cleveland...
Don't be croo-el!
HI, KIDS!!
PICK ME, MONTY!!

REALITY CHECK

by Thomas Nolle

Local exchange competition: Nice idea, but will it work?

Amidst all the talk about cable companies getting into the local phone services market (Aug. 8, page 1), has anyone stopped to consider how realistic this proposition is? Cable companies and carriers have very different approaches to infrastructure reliability, service response, redundancy and other areas. In the long run, we may find that local exchange competition just doesn't compute.

It's popular to say that the U.S. has the best telecommunications infrastructure in the world. It's popular to say that competition is central to achieving technical progress. If the first statement is true, we should support the communications industry and regulatory environment that has shaped it. If the latter is true, we should promote alternatives at every level of carrier connection.

More than 10 years ago, we fought this issue at the interexchange level. Now, it's the local exchange that has to be decided. Which view of the industry do we believe?

Local exchange carriers (LEC) are a part of every user's communications network. Anything that pervasive just has to be a problem for a lot of people, and that's sure true with the LECs. Users think LECs charge too much, noting that it often costs as much (or more) to run a T-1 line the two miles from the interexchange point of presence to the user's office as it does for the interexchange mileage between two cities. Interexchange carriers think that high local exchange connection charges are stifling the opportunities for new services – including ATM.

Congress is now debating some legislation that would set the legal boundaries for local exchange competition and, possibly, reduce the restrictions on just what formerly regulated members of the Bell system can offer users. Many people expect some great bonanza of broadband services at nearly zero costs.

Zero costs? To be sure, nobody's coming right out and saying that. But think a minute. We do have people talking about ATM delivery of video dial tone to the home. The current cost of T-3 bandwidth, the minimum capacity that would be credible for this application, is more than $3,000 per month for local access alone. This is more than your typical yuppie mortgage payment, and certainly a lot more than consumers who just petitioned Congress to lower their $23 per month average cable bill are likely to jump at. If we're going to get our penny-pinching, whining-to-Congress consumer to shell out for ATM, we'll have to get it down to that $23/month range. That's less than 1% of current costs.

According to some press agents for cable companies, this radical cost reduction happens by "leveraging the extensive cable television infrastructure." CATV, after all, uses high-tech coaxial and fiber delivery; LECs use crummy little copper pairs. If we can carry voice and video over CATV to feed our appetites for sitcoms, why not use the same media to talk to our mothers or business clients?

Lack of reliability, for one reason. Recently, as I talked on the phone with a cable company spokesman about this infrastructure, I looked out my window and saw two little boys pull up about 50 feet of CATV cable from a trench and use it to simulate the gas hose in a bicycle-based game of "tanker refueling fighter jet." They sure leveraged that infrastructure. In the process, a lot of people probably lost CATV service.

Like many of the people I've talked to, I have a CATV outage about once every 10 days. At least a couple times a year, most people have outages lasting several hours. On the other hand, phone problems are so rare that most people can't accurately state when the last one happened.

The reason is simple: Telephones are literally a lifeline, and we just won't tolerate problems with them. CATV is entertainment (well, sort of), and we can live without it. It's fun to talk about how our vast cable resources would be harnessed to provide competition for the LECs, but how realistic is it?

The CATV base is designed for one-way delivery of analog data. How much of the cable plant is even capable of supporting high bit rate digital data at acceptable rates? Who knows? How much equipment would have to be deployed to create a two-way structure capable of handling our business data exchanges and business and residential voice? Who knows? How many subscribers will shell out for ATM video, or any other form of video on demand, after having lobbied Congress to have rates reduced? More importantly, who will pay for the experiment to find out?

There's a serious question of the impact that wholesale local exchange competition might have on the price we pay for phone services. For all the hype about bypass, most of the efforts have been focused on the high-rent areas of major cities where big companies are spending megabucks. Even a high-tech suburban business might not see much in the way of bypass alternatives to the LEC. There's just too much suburbia out there, and too much infrastructure is needed to reap what are individually only little pockets of opportunity.

What about cable company fiber optics? Most cable companies have less than 200 miles of fiber, and most businesses won't be very close to any of it.

If local exchange competitors won't be serving you, they may be costing you. Businesses pay more for phone service to help subsidize residential rates. If you pull businesses out of the LEC's customer base, the subsidies fall.

Do we then turn to residential users and ask them to ante up? Not in a real political world. Residents vote; businesses don't. The result could be a rate hike for the business users, especially those who don't get the benefit of local exchange competition.

Telephony in the U.S. is a regulated monopoly. In many areas, so is CATV. That may tend to stifle some innovation, but it also protects us from competitive-driven excursions into risky technology and sideline businesses.

We've established a deregulated airline industry that seems to be taking forever to get flights anywhere, and that's not making any money for any of the air carriers to boot. We can't afford a similar exercise in telecommunications. Hopefully, Congress won't open the door for just that to happen.

Nolle is president of CIMI Corp., a technology assessment firm in Voorhees, N.J. He can be reached at (609) 753-0004 or via MCI Mail at 349-5845.

SPECTRUM AUCTIONS

by Ira Brodsky

Time to phase out exclusive licenses

With winning bids totaling more than $800 million, Reed Hundt's Federal Communications Commission is basking in the success of the recent spectrum auctions (Aug. 1, page 4). But the FCC embraced spectrum auctions for the wrong reason. Worse, the windfall may give the FCC an incentive to block the introduction of exciting new technologies that could eliminate the need for exclusive licenses altogether.

The original goal of competitive bidding was to provide a fairer, more market-driven method of distributing spectrum access rights. The old system —committee-based comparative hearings — broke down at the inception of the cellular telephone industry, when the FCC was flooded with thousands of professionally prepared license applications.

The recent auctions, however, were neither fair nor market-driven. More importantly, the spectrum auctions delighted members of Congress because they proved they could serve as a new source of government revenue, at a time when voters are fed up with escalating taxes.

By auctioning off tiny slivers of bandwidth in prime spectrum below 1,000 MHz, the FCC has managed to create at once a new market and its first shortage. Not surprisingly, prices jumped through the roof. For example, the FCC allocated just 1 MHz of spectrum for narrowband personal communications services (PCS); in this minuscule space, a multibillion-dollar industry with more than 18 million subscribers is supposed to develop and launch its next-generation services. No wonder paging industry giants were willing to bid tens of millions of dollars for puny 12.5-kHz and 50-kHz channels.

By offering discounts to special interest groups, the FCC has made a bidder's gender or race more important than their wireless vision. The way to redress past social injustices is to make sure they never happen again, not hand out discounts based on an accident of birth. Squeezed out of the middle are countless entrepreneurs who, in many cases, have struggled for years to find a home in the radio spectrum. An emerging industry cannot expect to succeed by subjecting its pioneers to such shabby treatment.

As if to make my point, the FCC has done a complete about-face on the Pioneers' Preference Awards. In order to encourage innovators to publicly disclose their ideas in petitions, the commission ruled that a pioneer could be guaranteed the first license in a new service. Then, in conjunction with its PCS rule making, the FCC granted Pioneers' Preference Awards to four such firms: Omnipoint Corp., Mobile Telecommunications Technologies, Inc. (Mtel), Cox Enterprises, Inc. and American Personal Communications (APC).

Under pressure from Congress and Vice President Gore, however, the FCC changed the rules in the middle of the game. The four "winners" will have to pay for their licenses after all. While Mtel and Cox Enterprises may be able to absorb the discounted cost, it could spell disaster for Omnipoint, which is a start-up, and APC, which claims to have already spent $20 million developing technology and lobbying the FCC. Nice going, Mr. Chairman.

But competitive bidding is an idea whose time has come and gone. Exclusive licenses made sense when all radio technologies were narrowband technologies. Then, the way to solve interference problems was to give each user his own frequency. Now, broadband PCS opens the door to more spectrally efficient technical solutions.

Microprocessor-based radios can quickly search out clear frequencies, take turns transmitting (by adhering to a radio "etiquette") or share frequencies by employing techniques such as spread spectrum. It is time we learn to depend on these "smart radios" rather than dumb licenses to prevent interference. Instead of auctioning off broadband PCS licenses, the FCC should simply say, "Here's 120 MHz of spectrum. For the first three years only, new users must share this bandwidth with incumbent users. Do whatever you want, as long as you follow a few simple rules designed to prevent interference."

Indeed, there has been a subtle shift away from licensing over the last decade, and the results have been stunning. Cellular telephone networks are licensed, but individual subscribers are not. Anyone can buy a residential cordless telephone without obtaining a license. These markets are booming.

So it is time to take the next step. Instead of being distracted by lucrative spectrum auctions, the FCC should start phasing out exclusive licenses. Broadband PCS is the perfect place to start: By throwing the 1.8-GHz band open to innovators of all shapes and sizes, the U.S. can launch a personal communications industry likely to rival the success of the personal computing industry. Such a bold move will surely catapult the U.S. ahead of Europe and Japan in this strategic global market. But more importantly, it will produce a windfall of new products and services for users to choose from.

➾ Brodsky is president of Wilmette, Ill.-based Datacomm Research Co. and chairman of the Wireless Data Conference & Exposition, to be held in San Francisco on Oct. 26-28. He can be reached via the Internet at brodsky@radiomail.net.

Letters

E-mail call

I am responding to Ed Krol's column on "Spreading the networking word" (Aug. 1, page 17). He talked about children having Internet E-mail addresses for communication when away at summer camp. I applaud his work in this area. With all the hype on television, newspapers and trade journals about the — God, I hate this term — Information Superhighway, E-mail is often forgotten.

E-mail allows a communication method among people that is blind to race, color, religion or creed. It provides a way for these kids to talk to their friends, regardless of their locations, which I thought was a main staple for the Internet. I sincerely hope Mr. Krol's efforts don't go unappreciated. And for all of us that use the Internet as a means of staying in contact with long-distance friends, you have my thanks, Mr. Krol.

Chad Yates
Consultant
Alternate Resource Corp.
Baltimore

Appropriate analogy

I just finished reading Mark Gibbs' column "Disposing of the dead whales in your organization" (Aug. 1, page 20). I know I have read the first part of the story somewhere; it caused me to chuckle then, and it did again when Gibbs' spin was put on it.

I am involved with Navy communications and its migration to the Defense Message System (DMS). The present Automatic Digital Network (AUTODIN) network (the whale) is being disposed of. Most likely, it will rot first (another time), but as the Navy moves to DMS, the parallel Gibbs draws is ironically identical. Our condo-sized chunks remain and are fully embraced by their users. Slowly but surely the legacy systems will be a memory rather than being left as a legacy for the new communicators to deal with.

Once again, a very good and appropriate article. Keep it up.

Dick Cadger
Senior member of technical staff
Computer Sciences Corp.,
Applied Technology Division
Falls Church, Va.

Book wanted

In his "dead whales" column, Mark Gibbs mentioned an ABC Toolkit for Total Process Management, published by Micrografx, Inc. What I am interested in is the book on reengineering, called *Eating the Chocolate Elephant* by Mark D. Youngblood, which Gibbs said is contained in the package.

I have checked with bookstores here, and they cannot find it from any of their distributors. Can you provide me with the publisher's name and address or any information on how to obtain it?

Marcy Birdsell
Administrative secretary
University of Notre Dame
Notre Dame, Ind.

Editor's response: Youngblood's book is available through Micrografx. Copies can be purchased for $24.95 each and $7.50 for shipping and handling. To place an order, call John Schwartz of Micrografx at (800) 733-3729, Ext. 6707. Purchase orders cannot be accepted for orders costing less than $500.

Good reading

Just a short note to let you know that Mark Gibbs' "Net Results" columns that appear in *Network World*

See Letters, *page* 54

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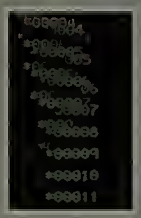

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NETWORKING EQUIPMENT

By

ALBERT IELLIMO

Few winners in cellular modem race

ZyXEL and AT&T Paradyne tear up the road with amazing throughput, while others run out of gas.

Going wireless today means buying some sort of equipment that enables you to speak the language of the airwaves — and that generally means a cellular modem for your laptop.

The primary factors to consider when buying a cellular modem are how effectively it can establish a connection and what kind of throughput it can deliver over treacherous cellular circuits. While cost is important, the price of a cellular modem pales in comparison to the transmission costs that can be incurred if it performs poorly.

TeleChoice, Inc., a member of the *Network World* Test Alliance, recently examined 10 cellular modems using an innovative testing setup developed by Telecom Analysis Systems, Inc. (TAS) of Eatontown, N.J. Through this first-of-its-kind trial we were able to uncover prominent differences inherent in various manufacturers' cellular modem technologies, in terms of throughput and overall functionality.

NET Result

Key findings:

- ZyXEL's U-1496P topped the list when sending data from a stationary vehicle over a clear cellular circuit to sites served by clear and impaired land lines, clocking in at 70.9K and 64.2K bit/sec, respectively.
- ZyXEL also took top prize in six tests conducted from a vehicle traveling at various speeds over different terrains. Using an impaired cellular circuit and clear land line, ZyXEL's U-1496P won five times and AT&T Paradyne's KeepInTouch Card triumphed once.
- When sending data over an impaired cellular circuit and impaired land line — the most difficult test — ZyXEL won again, achieving a maximum throughput of 46.7K bit/sec over a suburban terrain at 25 mph.
- AT&T's Enhanced Throughput Cellular error-correction protocol bested the industry standard MNP-10 protocol in almost all cases, but ZyXEL's proprietary ZyCellular beat them both.

Vendors with existing products on the market were asked to participate. Of the 15 vendors known to be shipping products today, 10 agreed to participate (see Figure 1).

Five other vendors — Intel Corp., Millidyne, Inc., Motorola UDS, U.S. Robotics, Inc. and Zypcom, Inc. — spurned our invitation to test because of concern over their modem's performance in this particular testing configuration.

The results of the trial outlined incredible performance differentials, with some modems routinely outperforming others by factors of eight or even 10. For end users, this would result in an eight- to tenfold decrease in communications expenses.

For sheer throughput, the ZyXEL U-1496P modem, running with the proprietary ZyCellular protocol, clearly bested the bunch. ZyXEL's U-1496P, though, is about the size of a large remote control, unlike other cellular modems that support the PCMCIA form factor. Under optimal transmission conditions, the U-1496P hit more than 70K bit/sec, challenging even some land-line modems. Even in the roughest conditions, the ZyXEL modem averaged nearly 40K bit/sec in throughput. Moreover, the U-1496P handled adverse cellular conditions with very consistent performance.

AT&T Paradyne's KeepInTouch Card and Toshiba America Information Systems, Inc.'s Noteworthy Cellular-Ready also fared well, especially on tough, impaired cellular and land-line tests. The AT&T Paradyne and ZyXEL modems were the only ones in the trial that were able to connect on all impaired lines and transmit successfully in each case.

HEART OF THE MATTER

Modems have existed for traveling users for some time. Internal and external versions for laptops have kept a variety of users in touch with customers and home offices since the earliest modems for portable computers hit the streets.

NETWORK WORLD TEST alliance

The problem, of course, is finding a place to plug in these wire-line modems. Ask any seasoned traveler staying at a hotel with phones hardwired, not plugged, into the wall how easy that is.

Continued on page 44

Trial members at a glance
Figure 1

Manufacturer	Sales number	Model	Standards support	Maximum line rate (K bit/sec)	Maximum DTE rate (K bit/sec)	Price	Warranty (years)
AT&T Paradyne	(813) 530-2000	KeepInTouch Card	ETC	14.4	57.6	$349	5
DATA RACE, Inc.	(800) 749-7223; (210) 558-1900, Ext. 267	RediCard 14.4/14.4 PCMCIA	V.42 cell	14.4	115.2	$399	5
MAXTECH (formerly GVC)	(800) 936-7629	PCM 144C	MNP-10	14.4	57.6	$149	5
Megahertz Corp.	(800) 527-8677	CC4144	MNP-10	14.4	57.6	$299	5
Microcom, Inc.	(800) 822-8224	TravelCard Fast 28.8	MNP-10	28.8	300 (parallel mode)	$599	5
Mitsubishi Information Corp.	(708) 860-4205	Portable Data Link 2000	MNP-10	14.4	57.6	$399	5
Toshiba America Information Systems, Inc.	(800) 959-4100	Noteworthy Cellular-Ready	TX-CEL over MNP-10, ETC and V.42	14.4	57.6	$329	1
Western Datacom Company, Inc.	(216) 835-1510	WorldCom V.32bis	MNP-10	14.4	115.2	$695	1
ZOOM Telephonics, Inc.	(617) 423-1072	PCMCIA 14.4C	MNP-10	14.4	57.6	$299	2
ZyXEL	(800) 255-4101	U-1496P	ZyCellular	19.2	76.8	$529	5

SOURCE: TELECHOICE, INC., VERONA, N.J.

Continued from page 43

Cellular modems transcend this problem, at least where cellular service is available. And cellular modems have much in common with the standard portable modems: They are available in both PCMCIA and external configurations and can use common analog phone lines to establish connections.

A cellular modem's most critical feature, however, is its ability to go beyond wire-line transmission in order to establish and maintain quality connections over the cellular network.

CELLULAR VS. ANALOG

Cellular modems are designed specifically for this task. Transferring data over the cellular network using standard land-line modems can be a nightmare because of the unique problems associated with cellular transmissions. Static, signal fading, interference and geographic pockets of weak or no reception are just a few of the common difficulties in dealing with the cellular network.

While these problems are generally nothing more than minor nuisances during a voice call, they can be deadly to modem connections — thus, the need for cellular modems that can weather the harsh conditions prevalent on the cellular network.

While PCMCIA or external cellular modems often look identical to their standard wire-line counterparts, the primary difference that distinguishes cellular modems is under the hood — support of a cellular error-correction protocol, such as AT&T Paradyne's Enhanced Throughput Cellular (ETC) or Microcom, Inc.'s Microcom Network Protocol (MNP)-10, that helps manage the cellular signal environment.

In one test, ZyXEL's U-1496P modem hit more than 70K bit/sec, challenging even some of the fastest land-line modems.

The performance differences between standard wire-line modems and cellular modems yield an unmistakable conclusion — only use a cellular modem for cellular transmissions. In comparing throughput using a standard land-line modem with cellular output, once any impairment is added, throughput drops. We tested AT&T Paradyne's Comsphere 3820 modem using only V.42 for error control. On clean cellular lines, throughput hit 48.9K bit/sec, comparable with AT&T Paradyne's KeepInTouch Card, which hit 53.8K bit/sec. Once we added impairments to the equation, throughputs dropped and the modems were unable to complete transmissions. This underscores the contention that these cellular protocols enhance underlying throughput.

The 10 cellular modems tested employed various cellular protocols. MNP-10 is a de facto standard protocol that provides extra error-handling control for poor or varying line environments, such as with cellular. MNP-10 is used in modems offered by DATA RACE, Inc., MAXTECH (formerly GVC Technologies), Megahertz Corp., Microcom, Mitsubishi Information Corp., Western Datacom Company, Inc. and ZOOM Telephonics, Inc., among others.

ETC was developed by AT&T Paradyne and is used by AT&T Paradyne's KeepInTouch Card. ETC is not a true standard, but is a protocol being licensed by AT&T Paradyne for use in cellular applications. AT&T Paradyne hopes to put forth ETC as a standard later this year.

ZyCellular, ZyXEL's proprietary protocol, is used only by the ZyXEL modem.

The Toshiba product employs ETC, MNP-10 and V.42, with Throughput-X-Cellular (TX-CEL) running in conjunction with all three protocols. TX-CEL is a throughput enhancement protocol recently developed by Celeritas Technologies, Ltd. of Mission Viejo, Calif.

In terms of relative scale, MNP-10 is certainly the most widely disseminated protocol, given the range of supporting modems. ETC is still an up-and-comer, and ZyCellular is not licensed at this time. ZyXEL is awaiting patent approval before it can proceed with licensing.

REACHING LIGHT SPEED

Another major difference between land-line modems and cellular modems is throughput. Today's land-line modems are hitting line rates of 28.8K bit/sec and throughput speeds up to 230K bit/sec. However, that's thanks to increased reliability in the local and long-distance nets.

Cellular transmission has a long way to go before it can reach that speed. While all of the modems we tested connected at the V.32bis standard rate of 14.4 bit/sec over land lines, none of them were able to establish and maintain a V.32bis connection over our simulated cellular network.

The plain truth is that the top V.32bis speed is rarely attainable over the cellular network, even during optimal transmission conditions. If such a high-speed connection is established, maintaining the connection is extremely difficult, unless there is a clear line of sight to the nearest transmitter.

Modem manufacturers are aware of this fact and, in many cases, have designed cellular mode operations to be conducted at 9.6K bit/sec or less. For instance, most MNP-10 modems in this trial were typically configured to connect at 1.2K bit/sec and then upshift when line conditions made speed increases possible. This is a default setting and can be changed by the user.

ETC-supporting modems, on the other hand, generally were configured out of the box to aim for a connection between 4.8K and 9.6K bit/sec. Most surprising, however, were the abilities of ZyXEL's modem, which employed the proprietary ZyCellular protocol. The ZyXEL U-1496P modem was able to establish and successfully maintain an unprecedented connect rate of 12K bit/sec.

OUR SETUP

The standards that a modem uses for setting up and maintaining a cellular transmission are critical to the success of an application. Because of the high preponderance of throughput-oriented applications in the cellular environment — such as file transfers or electronic mail — our test setup concentrated on these capabilities.

The problem with testing the performance of these various protocols and modems against one another has been that no truly reliable and replicable system to test available cellular modem's abilities has been available to date.

AT&T Paradyne sponsored its own testing of ETC vs. MNP-10 in 1993 by driving a van around select metropolitan areas and making phone calls, but there was no guarantee that each line was equivalent from test to test, modem to modem, and only two modems were tested.

TeleChoice used a new modem testing environment from TAS that was designed specifically for simulating the cellular environment. This consisted of a newly developed radio frequency (RF) simulator, dubbed the TAS 4500 RF Channel Emulator, which allowed testers to mimic signal impairments and cellular transmission problems caused by different vehicle speeds (see story, this page).

We needed computers that could recognize the various PCMCIA cards that we would be testing. To this end, AT&T Global Information Systems supplied us with two AT&T Safari 3180 486 laptop computers to conduct the PCMCIA modems for our trial. We had to install the various drivers for the PCMCIA modems, which took some time (see story, page 48).

With the drivers for each PCMCIA installed, we next had to establish the physical

Continued on page 48

HOW WE *did it*

Until recently, testing cellular modems has been a challenge, to say the least. Cellular carriers and modem manufacturers have been forced to pack employee cars with test equipment and drive around in circles, sending files while also avoiding traffic and pedestrians.

And in the end, testing over the public cellular network invariably has introduced too many unknowns that could affect the test results.

For example, if a file transfer conducted from a moving vehicle suddenly failed, it would be extremely difficult to gauge whether the problem lay in the modem's abilities, the geographic area in which the failure occurred (such as an isolated pocket of weak or no-signal reception) or the cellular net's equipment.

One of Telecom Analysis Systems, Inc.'s (TAS) newest additions to its testing equipment family, the TAS 4500 RF Channel Emulator, overcomes these testing obstacles and permits repeatable and accurate testing of wireless technologies, such as cellular modems.

The TAS 4500 anchored our testing setup. It emulated the various impairments that can occur over the cellular network, such as delay, fast and slow signal fading, and signal path loss. Additionally, this hardware also simulated the speeds of the virtual vehicles from which we transmitted, at 25 and 55 mph.

We created simulated cellular network-to-public-switched telephone network (PSTN) connections by integrating the TAS 4500 with a TAS Series II Network Emulator, a TAS 240 Loop Emulator, a TAS 1022HS Dual Terminal Emulator, a Motorola-Bell Atlantic Special Edition III mobile phone (and Motorola Cellular Connection RJ-11 adapter unit) and a Motorola R-2600 Communications System Analyzer.

The TAS 1022HS controlled and measured the data transfers through the modems in the end-to-end test, while the TAS Series II and TAS 240 simulated the PSTN. The Motorola R-2600, which was connected to the antenna of the Motorola-Bell Atlantic Special Edition III mobile phone, simulated an analog cellular cell site (base station) and mobile telephone switching office in addition to controlling the call setup signaling and cell handoff.

The TAS 4500 served as the ether between the modem and the cell site. A Windows-based 80486 computer ran TASKIT/Auto, the Windows application developed by TAS to automate the testing process. This setup greatly streamlined and automated the testing process.

First, configuration files were created to correctly strap each modem via AT commands. Next, we simply created test session files that would automatically recall a particular modem's configuration files and download a particular impairment setup to the TAS 4500. Lastly, TASKIT/Auto established a connection between the modems and sent the required data from one end to the other, while measuring and recording the throughput. The connection would then be dropped, and the automated test would continue to the next connection and file transfer.

The TAS 4500 unit can also be used to test various types of wireless voice and data equipment, such as cellular telephones, personal communications terminals, wireless local nets, pagers and base station equipment.

The components of the system are generally available products today from TAS. The company plans to offer an integrated system for wireless testing available before year end. For more information on the TAS 4500 or other TAS equipment, contact TAS at (908) 544-8700.

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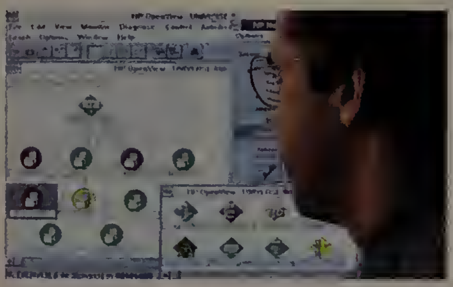

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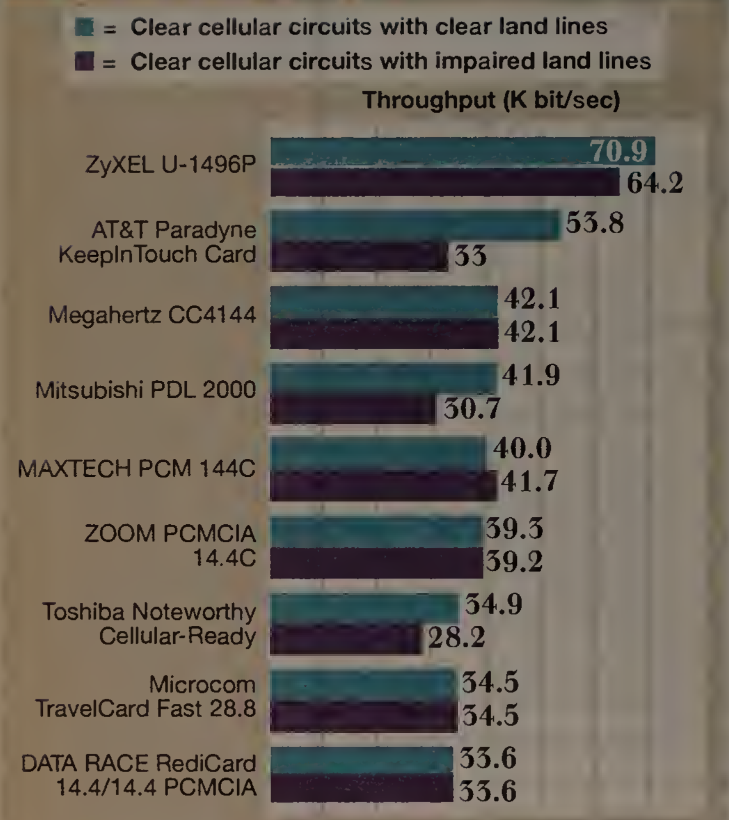
Continued from page 44

connection between the internal modems and the TAS test equipment. For this, we utilized P.C. Pod, a software package developed by TAS for passing data between a computer's communications port and the modem.

After installing this software on the Safari notebook computers, P.C. Pod allowed us to simply plug the modems into the Safari notebooks' PCMCIA slot and then control them via a serial port connection between the laptop and the TAS Gemini 1022 Dual Terminal Emulator (DTE). P.C. Pod, therefore, served as the data bridge between the internal modem and the Gemini 1022 DTE port.

Throughput results from stationary vehicle

Figure 2



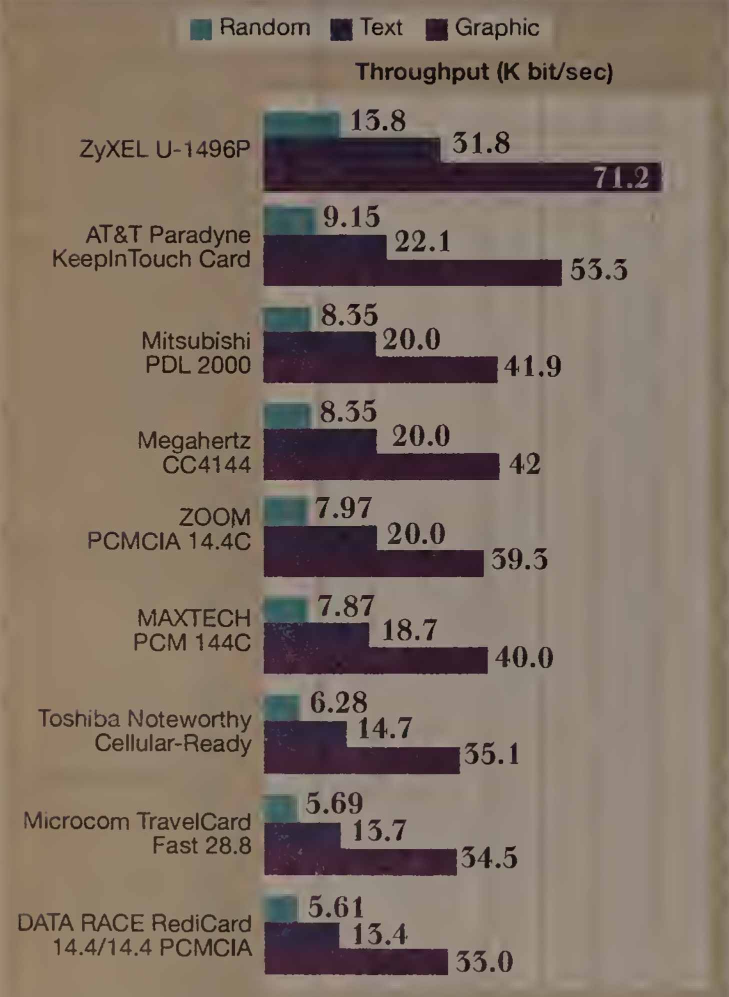
Western Datacom Company, Inc.'s WorldCom V.32bis was unable to complete testing in accordance with the established methodology.

GRAPHIC BY SUSAN SLATER

SOURCE: TELECHOICE, INC., VERONA, N.J.

File transfer rates over clear cellular circuits and land lines (Transmitted from stationary vehicle)

Figure 3



Western Datacom Company, Inc.'s WorldCom V.32bis was unable to complete testing in accordance with the established methodology.

GRAPHIC BY SUSAN SLATER

SOURCE: TELECHOICE, INC., VERONA, N.J.

We then created files through TAS' TASKIT/Auto software that sent the necessary AT commands needed to configure the modems for cellular mode operation. This process varied from modem to modem. While we requested that each manufacturer provide us with the necessary AT strap strings — or bootstrap procedures — to configure their modems for our test setup, often these straps would not work. These strap strings were supposed to reflect the optimal cellular settings for these modems.

Some particularly unruly modems even took days to troubleshoot. This debugging effort underscores that, in many cases, getting a cellular modem to operate effectively in cellular mode requires much time, tweaking and technical support, not to mention a healthy dose of patience.

HOW WE TESTED

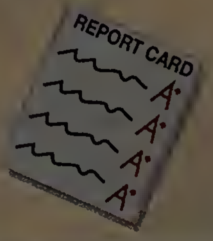
While other modem trials conducted by *NW* in the past have been based on EIA/TIA industry specifications for modem testing, readers should note that in this case, there are currently no industry-accepted standards or methodology for testing cellular modems.

Consequently, the methodology for this trial was created through joint discussions between TAS engineers and TeleChoice consultants well versed in modem technology. The foundation of this methodology consisted of a desire to make the testing applicable to real-world situations.

Our test calls were made between a simulated mobile station on the cellular side and a simulated wired station on the land-line side. (Tests were performed in each direction. Results listed in this article are for land-line-to-mobile direction; opposite direction results were deemed comparable.)

Based on the TAS 4500 RF channel emulation capabilities, we were able to devise a series of tests that we feel accurately simulate the situations in which cellular modems will be used.

Only the ZyXEL U-1496P and AT&T Paradyne KeepInTouch Card modems were able to pass all 63 tests.



Our trial, therefore, manipulated variables that coincided with different types of terrain, different car speeds and different land-line transmission conditions. The tests looked at just asynchronous throughput, as this represents the majority of cellular applications today.

The first set of parameters — terrain — was based on research conducted by Bell Atlantic Corp. in 1992 to study signal strength, fast fading and slow fading, characteristics common to RF channels. We simulated three typical types of RF environments that mimic those found in rural, suburban and urban terrains. Each one of these terrains has RF characteristics unique to it that will make the nature of cellular transmissions vary from one environment to the other.

We also simulated three typical mobile cellular transmission scenarios to replicate calls made from a stationary car, a car traveling on side roads or in moderate traffic at 25 mph, and a car traveling at a legal highway speed of 55 mph.

In addition to varying the conditions on the cellular side of the call, we also chose to vary the conditions on the public-switched telephone net side — that is, the land-line connection part of the call.

Two public network line conditions were employed: a clear local line and an impaired local line, both based on modified EIA/TIA specifications. Our testing sequence called for using these variables in different combinations. A grand total of 51 calls were possible. We allowed the modems three calls for each impairment combination because even the best performing modems could not always connect and successfully complete the file transfer. The best case throughput out of the three possible calls was measured and used in our analysis. If a modem could not connect within three tries, the modem failed that test.

We established a baseline of results by conducting six calls from a stationary car — three calls with a clear land line and three with an impaired land line. Being that the "car" is not moving, this speed effectively represents a clean cellular circuit and is a good baseline for comparison. Terrain is not really an issue for a stationary modem. A highly compressible graphic file of approximately 131K bytes was

Victims of PCMCIA driver complexity

Installing a PCMCIA cellular modem in your laptop is not as easy as sliding the unit into a PCMCIA slot. You have to install driver software so the laptop can acknowledge the modem and guide data to the right places.

Just as in any software installation, the process for PCMCIA modems ranges in diversity and complexity. Consequently, users should be aware that PCMCIA installation has not quite yet reached the point of plug and play today. PCMCIA modem drivers for one modem will not necessarily be compatible with another manufacturer's modem, so drivers needed to be customized for each PCMCIA card.

At first, our solution was to run the PCMCIA driver installation disks that came with nearly all of the modem cards. These disks would generally create a directory on the hard drive, copy a series of drivers and/or terminate-and-stay-resident (TSR) programs to that directory, then modify the CONFIG.SYS and AUTOEXEC.BAT files accordingly to access and run those drivers.

MAXTECH, for instance, required us to simply create a directory on the hard disk, copying one executable file to this directory, then adding a line in the AUTOEXEC.BAT file to execute the driver. Other installation programs, such as the one provided by Megahertz Corp., were more time-consuming and involved accessing many configuration screens for the implementation of the PCMCIA modem. While this software was very thorough and offered many options for customization, it also required us to reboot the laptop no less than three times.

Microcom, Inc.'s installation software was both slick and fast; after executing a file off the installation diskette, the software automatically booted Windows and brought us into an Options screen. From there, we chose an Express Setup option and were up and running in a matter of minutes.

The real pain, though, is in configuring these modems. We were forced to install each modem and its drivers, note the changes or modifications made to the AUTOEXEC.BAT and CONFIG.SYS files, and then make duplicates of these files for each modem. Complicated, yes, but necessary.

Then we came across ZOOM Telephonics, Inc., which ships its cellular modem bundled with a software package called PhoenixCARD Manager Plus Version 3.0. This software was designed for hot-swapping PCMCIA cards. Not only did it allow us to set the parameters for using the Zoom PCMCIA modem, but it also let us set them for other PCMCIA cards, as well, making it a definite added value for the dollar.

After installing and configuring this software (a process that took only a few minutes), our AT&T Safari laptop computers recognized all of the modem cards without requiring individual drivers for specific modems.

This software saved us hours of work during the trial by permitting us to simply swap PCMCIA cards at will.

transferred to achieve throughput levels.

Six calls were then made at both 25 and 55 mph for each of the three terrains using the same file size. This resulted in 12 calls and file transfers for each terrain, a total of 36 call attempts for all three terrains. Finally, to assess the impact of different file types, we conducted nine more calls/file transfers over both clear cellular and clear land lines. We transferred the same graphic file three times, plus a moderately compressible text file (approximately 64K bytes) and an uncompressible random file (approximately 32K bytes) each three times also, as per EIA/TIA specifications.

HOW THEY STACKED UP

The results among the protocols was nothing short of dramatic.

In the baseline stationary car transmissions over clear and impaired land lines, ZyXEL was the winner (see Figure 2, page 48) topping out at 70.9K and 64.2K bit/sec, respectively. The AT&T Paradyne modem came in second on a clear land line with 53.8K bit/sec and the Megahertz modem was in second place on an impaired land line with 42.1K bit/sec.

The throughputs of the other modems varied. On clear land lines, most of the modems fell into the 33K to 42K bit/sec range, and on impaired land lines there was greater variance.

The difference between the highest ZyXEL scores and the poorest score, by DATA RACE, was more than double, which in a practical environment would mean more than two times more in usage costs for DATA RACE users.

And that's the best it gets — clear cellular lines and clear local lines. Throughput differences were much more dramatic over impaired cellular lines.

Except for urban terrain at 55 mph, ZyXEL came in first in file transfers over impaired cellular lines with a clear land line (see Figure 4). Its best throughput hit 53.9K bit/sec over a rural terrain at 25 mph, and its lowest throughput was a quite acceptable 18.6K bit/sec over an urban terrain at 55 mph.

Nipping at the ZyXEL modem's heels was the AT&T Paradyne KeepInTouch Card, boasting an impressive throughput of 43.6K bit/sec over a suburban terrain at 25 mph, and clocking the best urban 55-mph score of the bunch — 26.4K bit/sec.

The Toshiba modem also left its mark in this category, performing at roughly the same range as the AT&T Paradyne modem. Unfortunately, even after much troubleshooting, the Toshiba was unable to perform adequately in MNP-10 or V.42 mode. That device's performance results are for ETC mode only.

The other modems, which all but DATA RACE's employed MNP-10, performed extremely poorly. No MNP-10 modem could attain throughput rates higher than 18.4K bit/sec, much less even come close to the average 40K bit/sec rate attained by the ZyXEL modem.

Most MNP-10 modems failed many tests completely, never being able to establish a solid connection for the data transfer, and, in instances where they did establish connections, throughput rates were either abysmal or nonexistent due to lost connections.

The Western Datacom WorldCom V.32bis modem was extremely difficult to configure, and despite lots of time with technical support, we could not get it to maintain a cellular connection without constraining throughput to around 2K bit/sec through various setup commands. Despite this, it connected more reliably than other modems in impaired testing.

As for the results attained in the most difficult of our test suites, the impaired cellular lines with an impaired land line, ZyXEL once again was the clear winner and passed with flying colors (see Figure 5). ZyXEL achieved a maximum throughput of 46.7K bit/sec over a suburban terrain at 25 mph.

Both the AT&T Paradyne and Toshiba modems also performed well. The AT&T Paradyne modem negotiated all the impaired lines; the Toshiba modem, however, was not able to handle the urban terrain test at 55 mph. Their throughput rates otherwise were in the same ballpark and never differed by more than 6K bit/sec.

All of the MNP-10 modems again performed poorly, failing to handle many lines and achieving throughput rates in most cases lower than 10K bit/sec.

In the last segment of our throughput tests, we transferred three standard file types over a clear cellular channel and a clear land line (see Figure 3, page 48). Again, ZyXEL beat the competition in this category. AT&T Paradyne's KeepInTouch Cardd just barely came in second, with Mitsubishi's Portable Data Link 2000 and Megahertz's CC4144 close behind.

Surprisingly, even though it supported the same protocol as the AT&T Paradyne modem, Toshiba's throughput results were significantly less. This proved to be neither the fault of the modem nor the protocol, but was a direct result of the strap strings provided by Toshiba for testing.

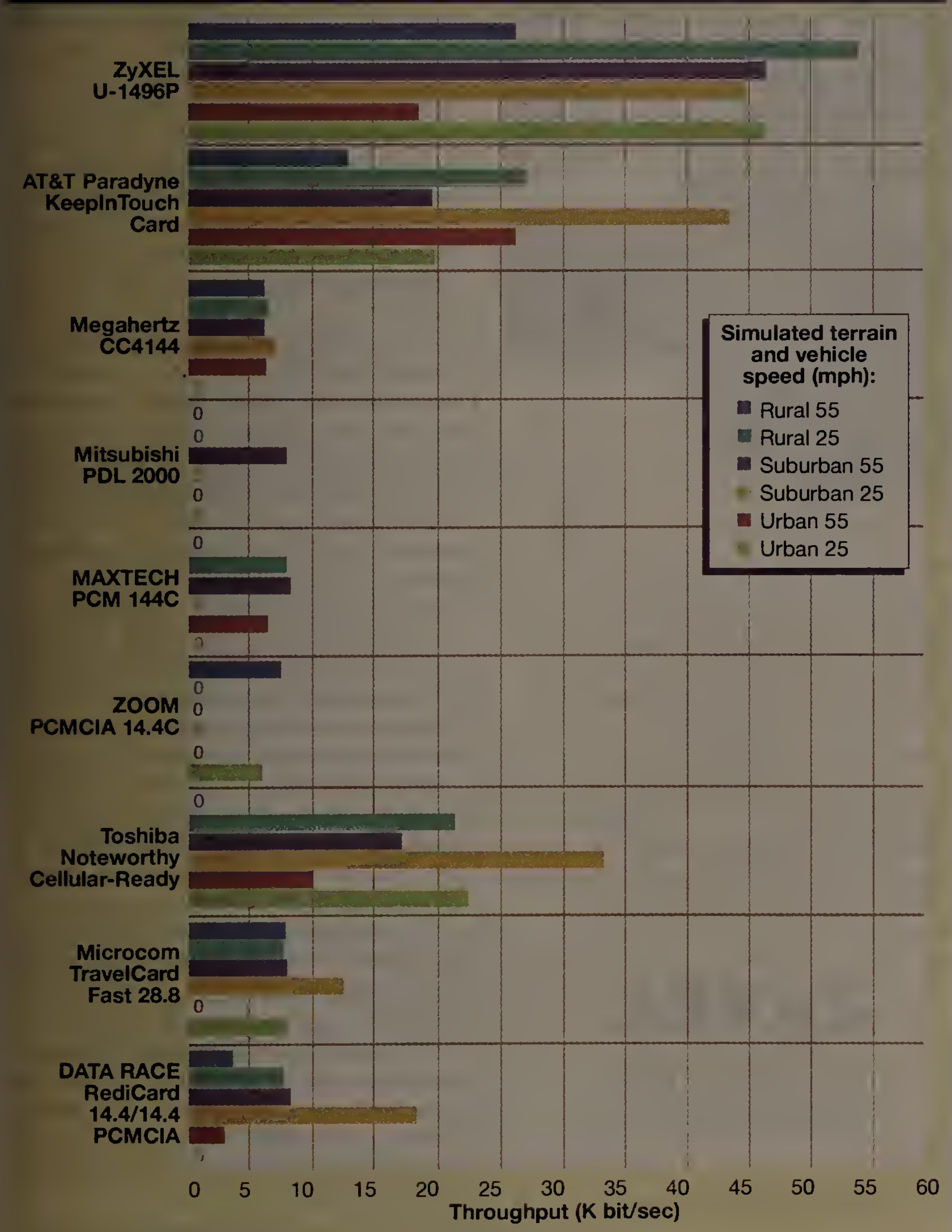
BUYING CELLULAR

After analyzing these results, we could draw some conclusions about transmitting over the cellular network.

In the modems that can truly weather the cellular network, better throughput is achieved at lower traveling speeds — the higher the speed at which one is traveling, the

Continued on page 50

Throughput results from moving vehicle
(Across impaired cellular circuits with clear land lines)
Figure 4

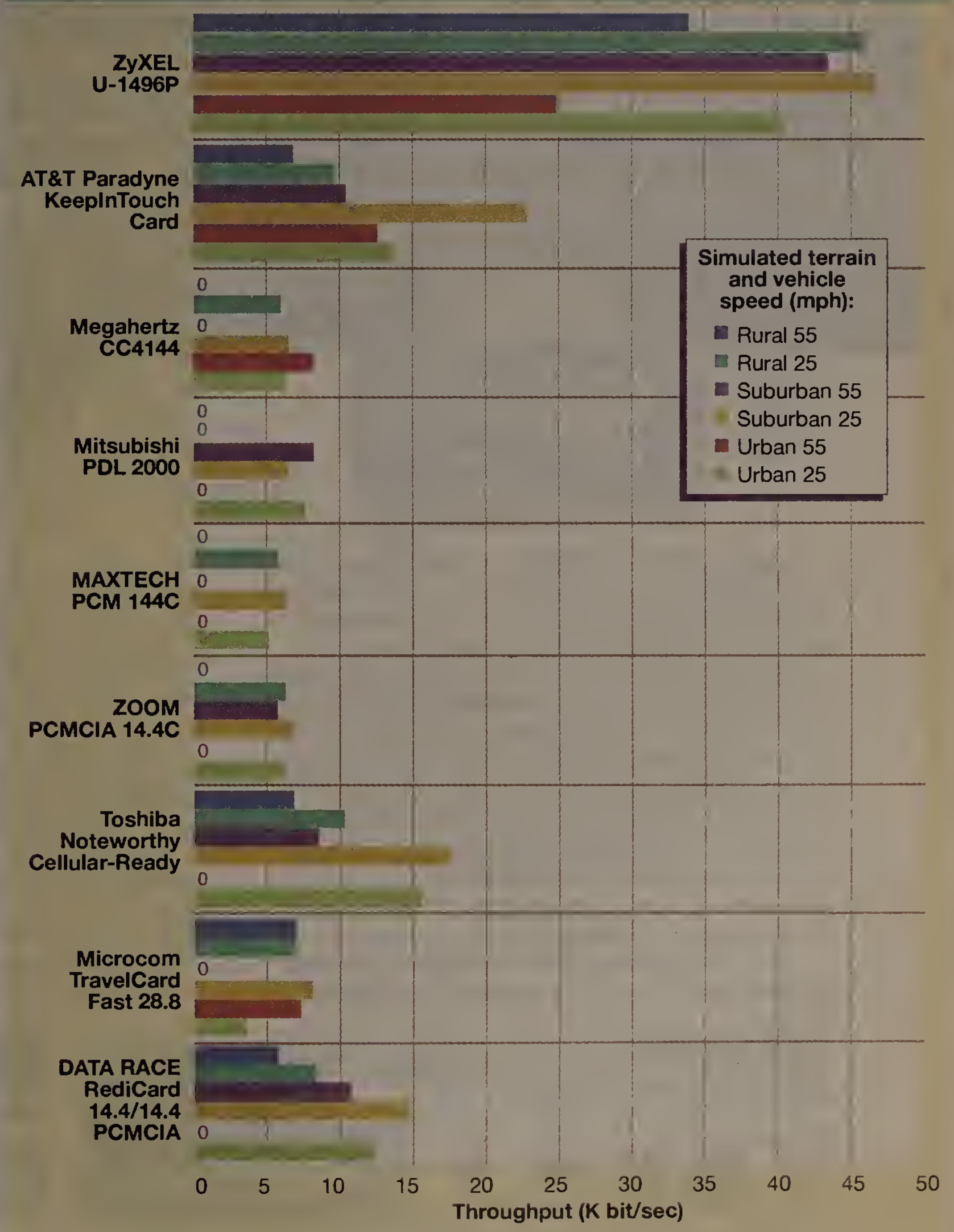


Note: Modems that scored 0 failed the test in question by not being able to connect or successfully transfer data in 3 attempts. Western Datacom Company, Inc.'s WorldCom V.32bis was unable to complete testing in accordance with the established methodology.

GRAPHIC BY SUSAN SLATER

SOURCE: TELECHOICE, INC., VERONA, N.J.

Throughput results from moving vehicle
(Across impaired cellular circuits with impaired land lines)
Figure 5



Note: Modems that scored 0 failed the test in question by not being able to connect or successfully transfer data in 3 attempts. Western Datacom Company, Inc.'s WorldCom V.32bis was unable to complete testing in accordance with the established methodology.

GRAPHIC BY SUSAN SLATER

SOURCE: TELECHOICE, INC., VERONA, N.J

Continued from page 49

worse the throughput. The best solution is to be transmitting while moving at 25 mph or less.

Additionally, transmitting in an urban environment tends to reduce throughput rates. It is unclear, however, whether rural or suburban environments are more damaging to throughput rates because in some cases the results were mixed.

There are clearly a number of top performers in this arena, with the ZyXEL U-1496P and the AT&T Paradyne KeepInTouch Card ranking among the leading contenders.

If you are looking for all-out throughput, ZyXEL U-1496P's the modem for you. It was the clear winner in almost all throughput aspects of this trial. That modem retails at $529, among the most expensive.

In terms of portability combined with overall performance, the nod goes to AT&T Paradyne's KeepInTouch Card. The ZyXEL modem is especially heavy and bulky, making portability the only major blemish on its otherwise flawless record.

By contrast, AT&T Paradyne's light PCMCIA solution makes up for any differences in throughput for those that are lugging a lot around. AT&T Paradyne's KeepInTouch Card costs a lot less, too, retailing at only $349.

Yet, if you choose to purchase the ZyXEL modem and expect to be conducting file transfers from a moving vehicle, you can take comfort in the fact that ZyXEL includes a cigarette lighter adapter with its U-1496P.

In third place is the Toshiba Noteworthy Cellular-Ready modem in ETC mode. Its results were also quite acceptable over impaired cellular and land lines, and it clearly surpassed the remaining modems with ease. Toshiba's Noteworthy Cellular-Ready costs $329.

THE CLEAR WINNERS

It should be noted that most of the modems that performed poorly over cellular impairments would most likely perform adequately over standard land lines. Bad performance over impaired cellular circuits was essentially due to inadequacies in the cellular protocol, not necessarily the modem.

The long-standing debate concerning the effectiveness of cellular protocols is slowly clarifying; both the Toshiba and AT&T Paradyne modems used the ETC protocol, while the ZyXEL modem used the proprietary ZyCellular protocol.

All of the other modems in the trial, which performed extremely poorly over impaired cellular lines, employed MNP-10. The results of this trial cast little doubt that ETC modems outperform MNP-10 modems.

> **The cellular modems tested range in price from $149 to $695 retail.**

The ETC-supporting modems generally connected faster and at higher initial connect rates than MNP-10 modems. When it comes to transmitting over the cellular network, the ETC modems are far superior to MNP-10 devices in aggregate throughput. This confirms AT&T Paradyne's previously published results.

ZyCellular, in its own right, performed significantly better than ETC. The only drawback to using ZyCellular is that it is a proprietary protocol; thus, you must have ZyCellular-capable modems at both ends of the connection, which means having ZyXEL modems at each end.

ETC, on the other hand, is currently being licensed by AT&T Paradyne to a number of modem vendors. Other modem manufacturers, such as Xircom, Inc., are slated to incorporate ETC into their products very soon. Still, ETC has not garnered enough of the modem marketplace to say that you are covered if you purchase an ETC modem for single-end applications.

AT&T Paradyne still has a way to go to meet the market acceptance that MNP-10 has. At this time, users should know that most of the market modems are outfitted with MNP-10. While we did not have the opportunity to conduct interoperability tests among the various cellular protocols, AT&T Paradyne's own testing showed little degradation during ETC to V.32bis/V.42 connections, prompting one to give ETC some benefit of the doubt. Future *NW* testing will delve into this question.

So in the end, while MNP-10 is both popular and currently being employed by a large base of cellular modems, our trial demonstrates that modems using this protocol are clearly not the best on the market. It remains to be seen, however, which cellular protocol will come to dominate the cellular modem market. Certainly, these results will prompt more than one manufacturer to call ZyXEL about licensing ZyCellular.

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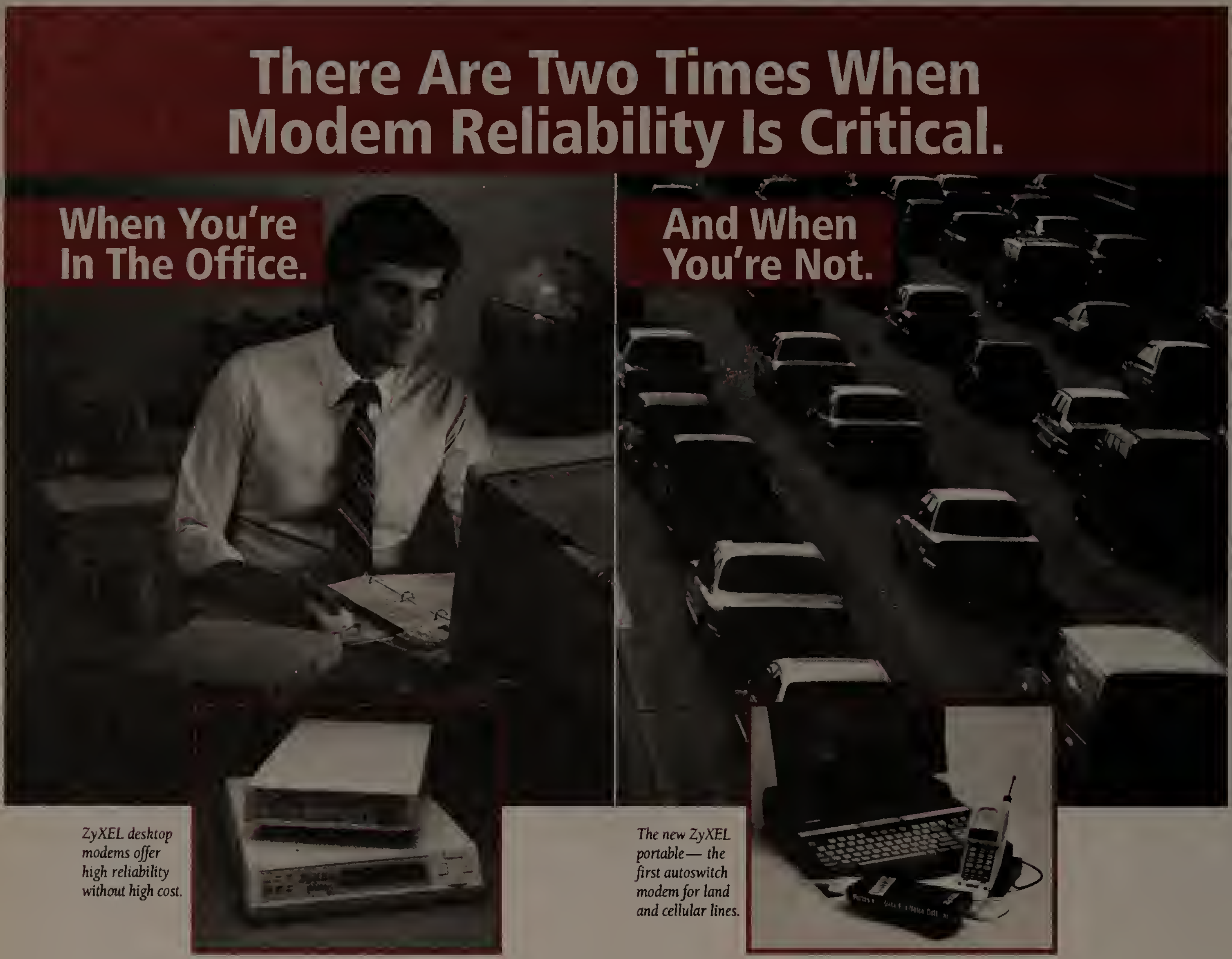

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ATM on the edge

The rapid adoption of access and edge devices in ATM deployment empowers users to implement the technology quickly and affordably.

By MARY JOHNSTON TURNER

It's not business as usual as the public carriers set about building next-generation public broadband networks.

To deploy public Asynchronous Transfer Mode services rapidly and affordably, carriers — including local exchange carriers (LEC), interexchange carriers (IXC), competitive access providers (CAP) and cable TV companies — are breaking many of their traditional network planning rules.

Instead of ramping up for across-the-board changeouts of existing telecommunications equipment and facilities, carriers are investing incrementally in smaller switches, as well as advanced fiber and Synchronous Optical Network (SONET) transmission. This allows them to control their own costs and ensure that they provide the capabilities users want.

In addition, new technology deployment decisions are being made by marketing departments rather than central engineering, and the pace of equipment depreciation is being accelerated aggressively in recognition of very short product life cycles.

Carriers are buying equipment from a new crop of suppliers that offer lower cost structures, more rapid time to market and an in-depth knowledge of enterprise LAN, router and hub issues. The relationships between the carriers and these new suppliers are different, as well, involving a great deal of joint application development and even joint sales calls and customer support.

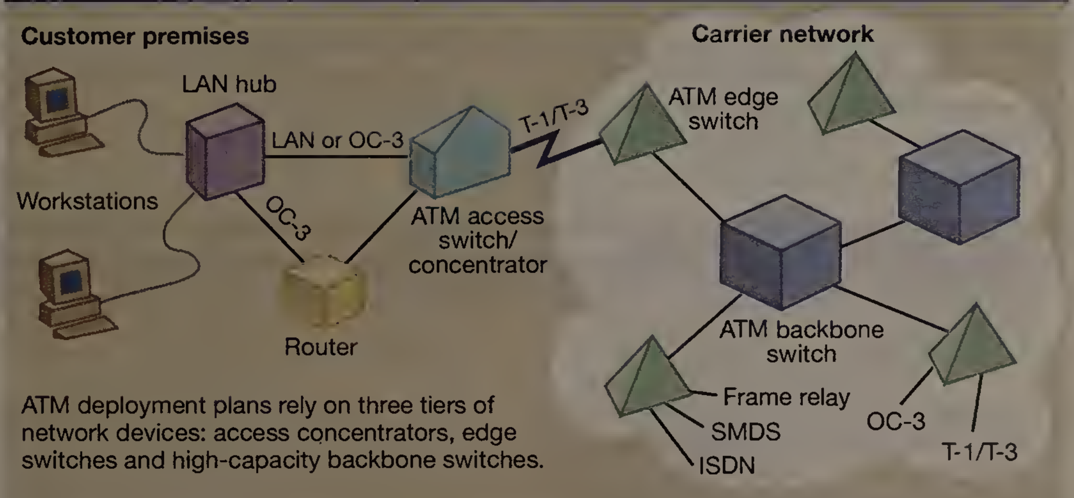
Traditional suppliers of very large central office equipment are still acknowledged as the leaders in carrier backbone systems, but the push across the board is for interoperability and compliance with ATM Forum standards.

To that end, carriers are developing new service architectures, which employ lower cost "edge" switches and access concentrators, in addition to high-capacity backbone switches. Using these devices at the network's periphery lets carriers build the network when and where customers need it, with lead times measured in months rather than years. Having been burned during the early days of ISDN deployment when they built a network and no one came, carriers are employing these small access devices to build the new broadband network one device at a time.

NETWORKS ON THE EDGE

Carriers are developing a new architecture for building public ATM networks. At the heart of this new architecture are edge switches and access concentrators from suppliers such as Newbridge Networks, Inc., General DataComm, Inc., Cascade Communications, Inc. and Fore Systems, Inc. (see graphic, page 52). Designed to handle routed traffic, most of this edge equipment is based on devices originally developed for the customer premises market.

Carrier deployment of ATM gear



ATM deployment plans rely on three tiers of network devices: access concentrators, edge switches and high-capacity backbone switches.

GRAPHIC BY SUSAN SLATER

SOURCE: NORTHEAST CONSULTING SERVICES, INC., BOSTON

Edge switches, generally sized in the 1G to 10G bit/sec range and costing from $50,000 to $200,000, are used by the carriers to integrate traffic from multiple customers (or buildings in the case of a campus) and are generally linked to customers' routers. They switch traffic between other carrier nodes and are the basis of the public WAN. Initially, many carriers are building their ATM networks using edge switches alone. However, most plan to introduce a second tier of backbone switches (in the 20G to 160G bit/sec range and priced at over $1M to start) as traffic on ATM networks ramps up.

Edge switches are owned and operated by the carrier. They can be physically located either at a local central office (CO) or point of presence (POP), or on the customer's campus. This benefits the user by reducing the cost of access circuits and allows the carrier to provide service to specific customers rapidly and at a low cost. CO- or POP-based edge switches typically have a limited range of supported high-speed network interfaces such as T-3/E-3, T-1/E-1 and OC-3 (155M bit/sec). When placed on the customer campus, edge switches may add Ethernet, token-ring and Fiber Distributed Data Interfaces, as well.

In some cases, these devices may also provide circuit emulation over the cell-based ATM net to support traditional voice and video services. This allows the user to integrate voice, video and data across the access circuit. When these voice and video circuits hit the backbone network, they are converted back to traditional time-division multiplexer signaling for processing by the legacy switched voice networks.

The backbone switches used in ATM deployment typically will rely on T-3/E-3, OC-3 and higher speed connections, such as OC-12 (622M bit/sec). By the 1998-2000 time frame, many carriers believe that the networks they are now building to support corporate data users and the separate networks now being built for residential users — such as Bell Atlantic Corp.'s Full Service Network — to provide on-demand video, will converge. Sometime after that, traditional switched voice services may be brought onto the new common backbone, as well. For now, however, the carrier ATM build-out for corporate users remains focused on data and multimedia.

As a result, access concentrators that interface directly to existing local networks are becoming equally important elements of the new broadband architecture. Carriers are using access concentrators as the primary means for providing native LAN interfaces, such as Ethernet, token ring and FDDI, to public wide-area services. This is similar to the way routers are already provided as part of end-to-end frame relay services from companies such as AT&T and WilTel.

Selling for half or less than half of the cost

Continued on page 52

Continued from page 51

of an entry-level edge switch, access concentrators provide a single ATM interface to the public network while accommodating the rich variation of interfaces and media used on the customer premises.

In some cases, the carrier may also supply the WAN router as part of a fully packaged end-to-end broadband service.

Access concentrators have little or no switching capability, are housed on the customer premises, and can be owned and operated by either the carrier or the customer. This flexibility allows customers to either use an end-to-end service on a monthly leased basis or buy and operate their own premises equipment, purchasing only transport service from the carrier.

An overview of ATM deployment plans being undertaken by selected carriers illustrates what users can expect during the next few years.

LOCAL LOOP INTENTIONS

US WEST, Inc.'s Interprise Networking Services division is committed to bringing ATM not only to business users, but also to the home. During the past five years, the firm has invested more than $200 million in fiber upgrades and SONET transmission technology to support ATM services. Its ATM architecture centers on using small, scalable, distributed edge switches interconnected via ATM backbone hubs.

Trials of this architecture have been running since late 1993, with one of the most publicized being the Network for Education and Research in Oregon (NERO). Funded by a $4.5 million grant from the National Aeronautics and Space Administration, NERO is a six-month trial started early this year in which five state university campuses are linked. NERO is providing US WEST and its switch supplier, Newbridge, experience with multimedia, medical imaging, supercomputer access, video and distance-learning applications.

US WEST characterizes its deployment strategy as just-in-time ATM and plans for controlled availability through mid-1995. Mark Marino, manager of ATM strategy development at US WEST, explains, "It makes sense to deploy this way. It minimizes risk, as well as allows for the agility and flexibility to provide multiple services and to work with the best switch available at the time. We expect a very fluid environment for the next three years. The customer is in the driver's seat."

US WEST took this approach based on market research showing that the early adopters of ATM represent 3% to 5% of their total data customers. The LEC expects the bulk of their data customers — the 65% that currently rely on 56K bit/sec to T-1 bandwidth — will look for ATM service in the 1996-1997 time frame. The remaining 30% of customers is likely to be satisfied with traditional non-ATM services until 1998 or later.

Pacific Bell also sees the need to provide links between business and residential broadband users. The company has embarked on an aggressive upgrade to its distribution plant, committing $16 billion during the next five years to lay fiber and install SONET in its net.

Jose Verger, ATM product manager for Pacific Bell, points out that the internal cost savings and operating efficiencies from running all traffic on one common ATM backbone are just as important as being able to deploy service flexibly and quickly. He says that both the internal efficiencies and the flexible service deployment capabilities are important for keeping costs at a level that users will be willing to pay.

Verger also says he sees a long-term role for edge switches and access concentrators in the public network. They will aggregate traffic and send it to higher capacity backbone switches as traffic demand grows.

Like US WEST, Pacific Bell's early efforts with customers such as Hughes Aircraft Co., Stanford University, Sun Microsystems, Inc. and Xerox Corp. have been a learning period.

GTE Telephone Operations Group, which a few months ago announced plans to deploy 55 Newbridge 36150s as edge switches in its top 10 markets, recently became the first U.S. LEC to cast its vote for a backbone supplier, as well. In choosing AT&T Network Systems' Globeview-2000 as its backbone switch, GTE Telephone is placing its bet on the value of ATM as a service integrator.

Mounting competition among suppliers of ATM edge switches and access concentrators is expected to drive prices down as much as 50% in the next 12 to 18 months, resulting in some vendor shakeout. Therefore, users may be best served by leasing ATM network equipment from their carrier.

The company's approach calls for providing customers with integrated access to broadband and narrowband services — such as T-1, 800, ISDN and frame relay — using modules on the Globeview-2000 designed for that purpose. This approach, says GTE Telephone, assures customers an economical and smooth migration from the current world to the broadband world of the future. GTE Telephone expects that edge switches and access concentrators will play an important role in supporting the full range of interfaces required by the customer to take advantage of integrated ATM access.

While most of the traditional LECs plan on the combined use of access concentrators, edge switches and backbone switches, MFS Datanet, Inc., a CAP, has chosen a slightly different tack. Characterizing its mission as providing LAN interconnect services, this CAP plans to rely on a network comprising solely edge switches for the foreseeable future.

MFS Datanet, which has been providing commercial ATM services for more than a year in its major metropolitan markets across the country, surmises that it can grow its network incrementally for several years simply by interconnecting edge switches.

"We believe performance and reliability will be better [using edge products] than relying on the larger backbone switches," says Bill Euske, MFS Datanet's vice president of product engineering. "Our equipment [from Newbridge and General DataComm] has been reliable since Day One."

Working with vendors to assure conformance to standards and interoperability across different vendors' implementations is a high priority for MFS Datanet, which sees the costs of interoperability testing as the price of getting service to the customer quickly.

IXC RAMP-UP

For their part, the IXCs also are using edge switches as a means of deploying ATM quickly.

Big iron on the backbone

Not to be outdone, traditional central office suppliers such as Fujitsu Network Switching of America, Inc. and AT&T Network Systems are moving rapidly to add edge switches and access concentrators to their product lines.

Fujitsu sees a long-term role for both edge switches and access concentrators linking to a backbone based on high-capacity switches such as the FETEX-150, says Steve Levin, director of strategic marketing. Fujitsu's 10G bit/sec FETEX-150, slated to grow to 160G bit/sec, has been at the heart of the North Carolina Information Highway test bed sponsored by BellSouth Telecommunications, Inc., GTE Telephone Operations and Sprint Corp.

Fujitsu presently includes a 622M bit/sec access concentrator in its product line and conducts ongoing interoperability testing with edge switch vendors such as Cascade Communications, Inc. and Newbridge Networks, Inc. as required by their carrier customers.

AT&T Network Systems has announced more backbone switch deals than any other vendor. Its 20G bit/sec (slated to grow to 80G bit/sec) Globeview-2000 customer list reads like a who's who among Asynchronous Transfer Mode service providers including GTE, Time Warner Cable, Pacific Telesis Video Services, US WEST, Inc., Ameritech Corp., Viacom International and several overseas carriers including Compania Telefonica Nacional de Espana S.A., Kokusai Denshin Denwa Company, Ltd. and PTT Telecommunications of the Netherlands.

AT&T Network Systems stresses a common switch architecture across its product line, which, in addition to the Globeview-2000, includes a 2.48G bit/sec edge switch as well as a module that accommodates interworking with the narrowband worlds of ISDN and frame relay.

The company is currently developing an access concentrator, slated to become available by the first quarter of 1995. It will support native mode LAN interfaces, as well as T-1 and Switched Multimegabit Data Services. The company also has a sweeping program to test and develop interoperability with other edge switches and access concentrators in the market.

Selected new equipment suppliers and key products

Company	Product/Type	Capacity	Selected customers	Price	Comments
Cascade Communications, Inc.	B-STDX-9000/ Edge switch	12M to 1G bit/sec	AirTouch Communications, MFS Datanet, UniSpan Consortium	$60,000-$120,000	Using its broad frame relay carrier customer base to move into ATM.
General DataComm, Inc.	APEX-NPX/ Edge switch	3.2G to 6.4G bit/sec	BT, MFS Datanet, Telcom Finland	$35,000-$300,000	Acquired ATM technology from U.K.-based Netcom to gain rapid entry to market; also has a backbone switch in development.
	MAC/ Access concentrator	1.4G bit/sec	None announced	$20,000-$40,000	
Fore Systems, Inc.	ASX-200; ASX-200 BXE/ Edge switches	6.25G bit/sec	Cablevision, Cincinnati Bell, Sprint, Unnamed Canadian CATV company	Starts at $52,000 and $79,500, respectively	Current generation of edge switch products priced 50% less than first generation.
LightStream Corp.	2010/ Edge switch	2.6G bit/sec	Continental Cablevision	$30,000-$250,000	Recent alliance with Tellabs to develop carrier-compliant products. Also engaged in joint venture with NEC to develop access concentrator.
Newbridge Networks, Inc.	36150/ Edge switch	640M to 2.5G bit/sec	BC Tel, GTE, MCI, MFS Datanet, NYNEX, Pacific Bell, Sprint, US WEST	$25,000-$150,000	Aggressive in risk sharing and joint marketing with carriers.
	36170/ Edge switch	12.8G bit/sec	None announced	Availability scheduled for October	Also has a backbone switch planned to scale to 100G bit/sec in development.
StrataCom, Inc.	BPX ATM/ Edge switch	9.6G bit/sec	AT&T InterSpan	Starts at $27,500	Joint venture with SynOptics to build end-to-end solutions.
Telco Systems, Inc.	HyperLynx-50/ Access concentrator	400M to 800M bit/sec	None announced	Starts at $16,000	Low-level access circuit multiplexing to bring ATM into existing carrier distribution plant.

SOURCE: NORTHEAST CONSULTING SERVICES, INC., BOSTON

But the telling difference lies in degrees. Where the LEC strategy relies on cost savings from backbone efficiencies to deploy ATM incrementally, many of the IXCs already have fairly sweeping ATM services in place. IXCs can offer a service nationwide using a relatively small number of switches and backhauling traffic to those switches from anywhere in the country.

Therefore, IXCs are often able to offer a full commercial service when the LECs are still in trials with only limited service availability.

AT&T Network Systems' investment in ATM reflects 20% of the company's total data and emerging technologies investment (including frame relay and private-line), according to Ron Toth, AT&T's InterSpan ATM product manager. The InterSpan Services Group, responsible for planning AT&T's ATM and frame relay strategies, currently offers T-3 access to its nationwide ATM service. The carrier's goal is to provide customers with a single ATM-based wide-area transport service that supports numerous access protocols and interfaces.

Testing 1-2-3

AT&T and its switch suppliers, StrataCom, Inc. and AT&T Network Systems, are working with the ATM Forum on issues pertaining to frame relay and ATM interoperability.

AT&T's architecture calls for a high-capacity backbone network that is surrounded by an access ring capable of converting a range of customer network interfaces and protocols, such as X.25 and frame relay, to ATM cells.

AT&T already provides and manages premises routers to support transparent end-to-end services. But no specific plans have been announced, the firm will likely include access concentrators as an option to provide customers with seamless integrated ATM access.

Sprint Corp., working with Newbridge, currently offers unchannelized T-3 ATM service nationwide. Based on its experiences with early customers, Sprint is moving to offer ATM access at rates below T-1 via an access concentrator, which is currently being selected.

AT&T's architecture calls for a high-capacity backbone network surrounded by an access ring capable of converting a range of customer net interfaces and protocols.

Sprint's focus, as with the other carriers, is on data networking requirements today. Yet with an eye toward the future, Sprint is working with several niche customer groups, including the entertainment industry, to expand ATM service offerings. Its special-purpose network, created in cooperation with Silicon Graphics, Inc., allows workers in video production studios to send videos, animations and graphics to one another and to clients for rapid review and feedback.

LEARN YOUR LESSONS WELL

Enterprise users developing ATM plans can glean several important lessons coming out of carrier ATM build-out plans. First, the focus is on data and multimedia.

While integrated voice, data and video access will be accommodated using circuit emulation, switched voice services, such as 800 and virtual networks, will operate on the same backbones as they do now until the year 2000 or later.

So beyond access integration, don't plan on seeing end-to-end integrated ATM networking for voice, data and video for some time.

Carriers and their suppliers recognize that they still have a lot to learn about the uses for ATM — and they are hungry for input. Most carriers have some type of user group to get ongoing customer input. Some carriers, such as Pacific Bell, even provide grants to customers to subsidize early trials. In other cases, suppliers will donate equipment for trials in hopes of building early market share. If you think you have an ATM requirement, it can't hurt to inquire about participating in these types of programs.

Carriers are even willing to glove-fit ATM rollout plans to specific customer needs. Don't wait for carrier initiative to get to your corner of the world.

Particularly with access concentrators and edge switches making single-customer deployment affordable, it pays to ask for early deployment if you've got the applications requirements. The carriers and their suppliers are happy to share their insights in exchange for learning more about the broadband world.

➡Turner is a principal with Northeast Consulting Resources, Inc., a Boston-based consulting company. She can be reached at (617) 654-0619 or via the Internet at turner@ncri.com.

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Help desk

Continued from page 2

these products, call Microsoft at (800) 426-9400.

A less expensive option would be to check out Syntax, Inc.'s TotalMail or Amadeus Systems Corp.'s MBLink electronic mail gateway products. TotalMail with Gateway includes the server and a choice of gateway products. Prices start at $995 for 10 users. Pricing for MBLink starts at $995 per gateway for a single-host version, which supports up to eight connected post offices.

Also available is a single-host version of each gateway priced at $3,995 that supports unlimited post offices through Microsoft and cc:Mail router programs. For more product information, call Syntax at (206) 838-2626 and Amadeus at (703) 448-8666.

How can I get Information on the Electronic Messaging Association (EMA) and its next conference?

Roberto Irribarren, Santa Clara, Calif.

According to an EMA spokesperson, the EMA is a nonprofit organization made up of more than 400 user and vendor companies. User members reflect the proliferation of electronic messaging into diverse industries, including petroleum, finance, health care and aerospace.

Vendor members are involved in all phases of messaging, including software development, mainframe and minicomputers, LAN messaging products and public networks.

The EMA's Messaging Leadership Conference brings industry and government officials together to discuss key management issues facing electronic communications today, including conducting business on the Internet, the impact of EDI on both business and government, developing multimedia technologies, telecommunications deregulations, and privacy and security issues. The next EMA Committee and Work Group meetings for EMA members only will be held Oct. 11 and 12, followed by the First Messaging Leadership Conference on Oct. 13 and 14 in Washington, D.C.

For more information or to receive a free EMA Membership Kit, contact the EMA via E-mail at info@ema.org or call Paul Moniz at (703) 524-5550.

Letters

Continued from page 41

have been well received by me and, I'm sure, many others. Gibbs' style of using vivid analogies, such as comparing the dead whale carcass to downsizing, makes reading about otherwise trite subjects interesting and enjoyable.

By the way, I have tried Micrografx's ABC Toolkit for Total Process Management, and Gibbs is right: It's an excellent tool. The package provides more than a flow-charting tool and business graphics; it includes a quality concept for applying the tools to one's particular organizational needs.

On behalf of all *Network World* readers, keep those excellent "Net Results" columns coming.

Mike Klimkosky
Management engineer
Kaiser Permanente
Oakland, Calif.

Narrow view

Regarding your article "Newbridge earnings fall; networking forecast cloudy" (Aug. 8, page 6):

I find it very interesting that those wizards on Wall Street are more than ready to trash a company or downgrade an entire industry based on their very narrow view of what profits should be. Granted, Newbridge's profits were less than expected. But since when is an estimate taken as concrete statement?

I feel that those on Wall Street that are investing in the so-called third wave of net technology firms are speculators as opposed to investors. A speculator, in my mind, is one that jumps in the game to make a quick profit. Once that profit is realized, or if it becomes apparent that profit is not to be made, they are off and running to the next opportunity. This approach makes much sense in a world where quarterly profits are all that matter.

Another prime example of this speculative approach is the recent Wellfleet Communications, Inc./SynOptics Communications, Inc. merger announcement.

Some pundits (those guys that have MBAs and no work experience in the industry on which they pontificate) said, "Uh-oh, my near-term profits are in jeopardy; therefore, this cannot be a good thing." These guys should get out of the game.

What the industry needs are investors with a long-term outlook and an appreciation of the technical aspects of the industry.

John Lounsbury
Systems engineer, reseller sales
Wellfleet Communications, Inc.
Billerica, Mass.

Sour grapes?

Regarding your CyberSpeak question about the Internet Engineering Task Force's (IETF) next-generation Internet Protocol (Aug. 8, page 4):

It's too bad that Tony Li of Cisco Systems, Inc., who replied to your question about the IETF's IPng (oops, IP6) selection by complaining about the fixed 16-byte address, didn't mention his sour grapes because the IETF didn't select the proposal he was backing.

Geoff Mulligan
Staff engineer
Sun Microsystems, Inc.
Palo Alto, Calif.

Sweet revenge

I enjoyed reading Daniel Briere's column on vanity 800 numbers (Aug. 15, page 39), especially since I've been a victim of a dropped-800 problem.

The problem is not limited to vanity numbers; it can happen on any 800 number. My home telephone number is the local version of Northwest Airlines' crew check-in 800 number. For several months, I was getting calls from confused flight attendants, usually at about 4:45 a.m.

After this went on for a while, I talked to the local Northwest crew base, which was sympathetic, and it prominently posted notices that its crews should not drop the 800. The number of these calls was reduced, but I still got a few.

I think I may have found a solution. Two weeks ago, I advised Northwest that I would start telling early-morning callers that their flights had been delayed, and that they should wait an extra two or three hours before reporting. I haven't had any calls since then.

John Ross
Independent consultant
Seattle

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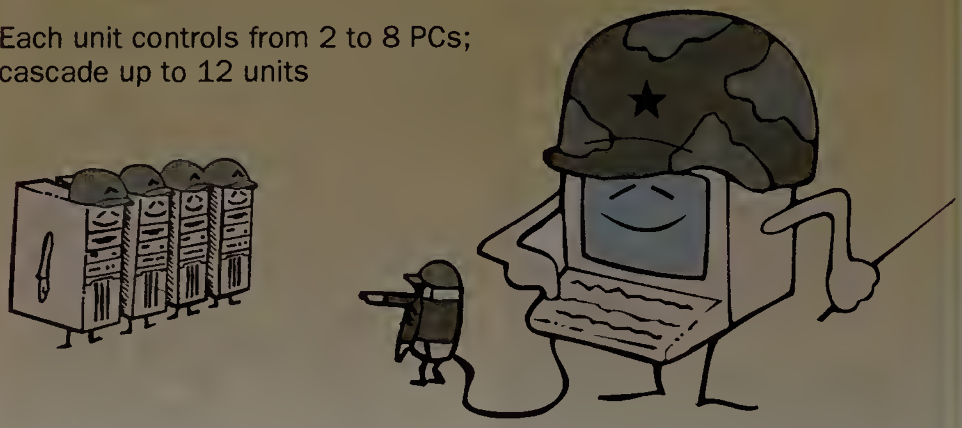

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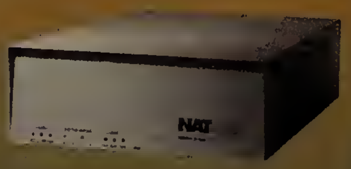

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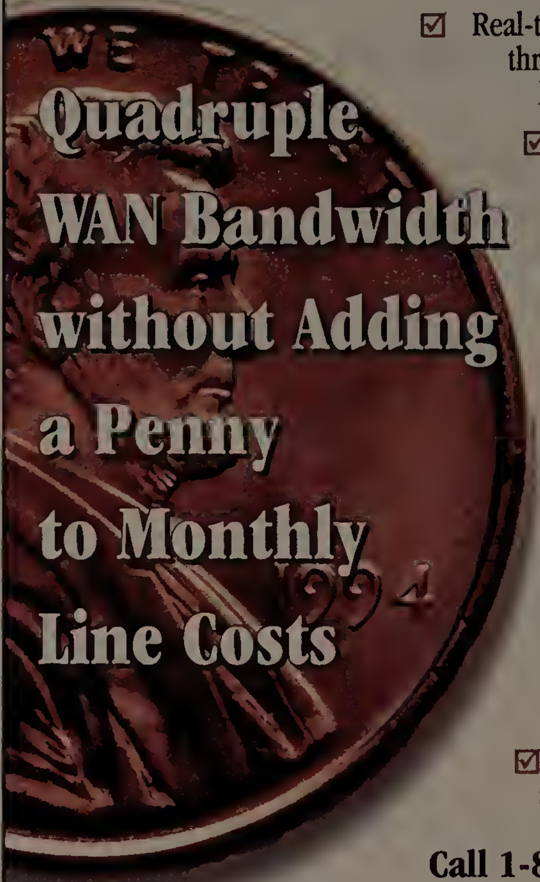

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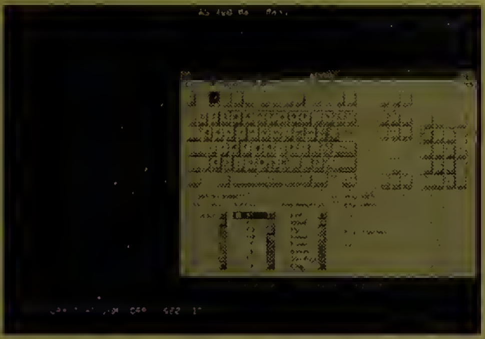

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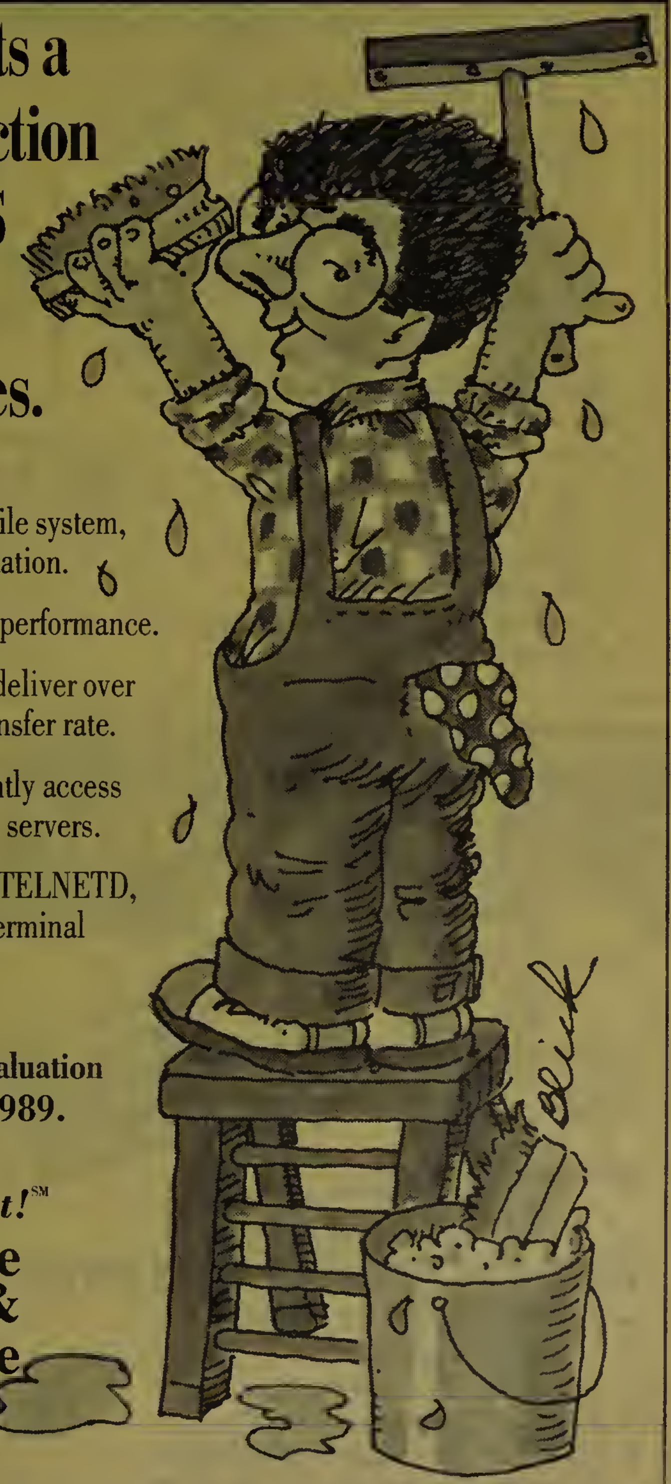

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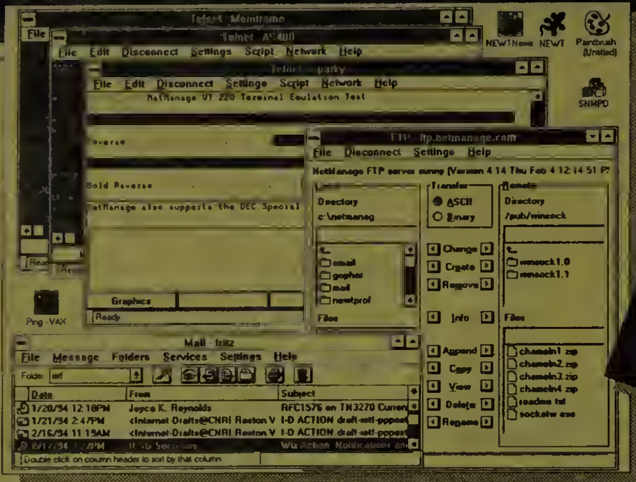

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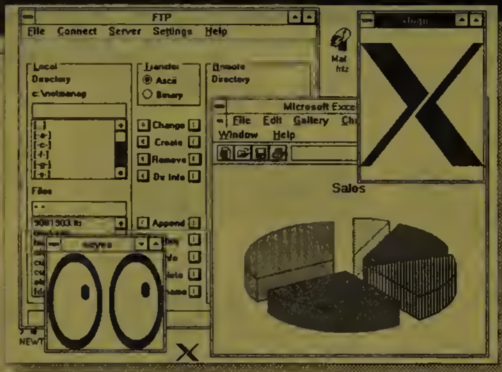

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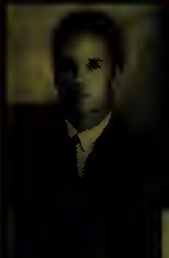

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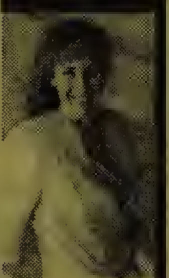

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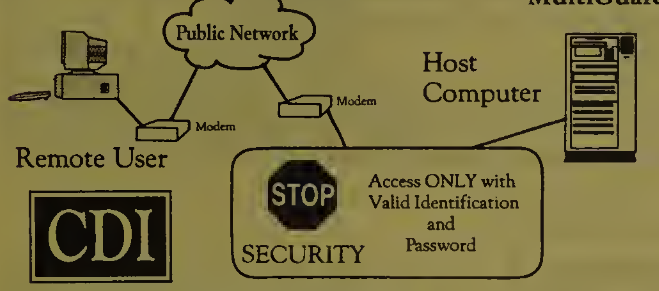

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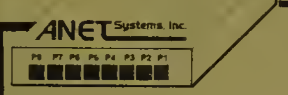
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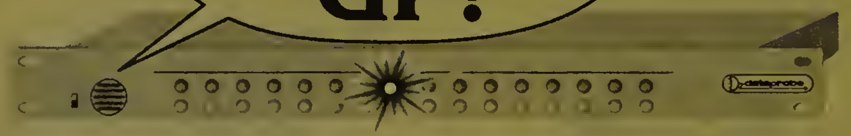

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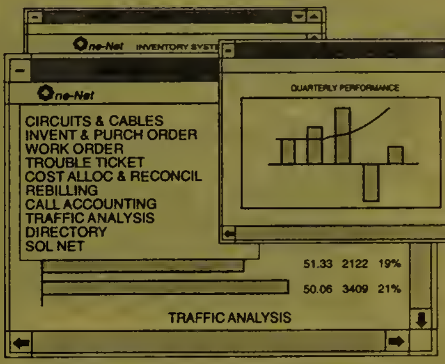

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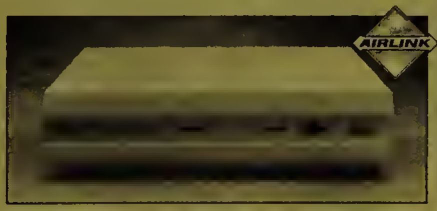

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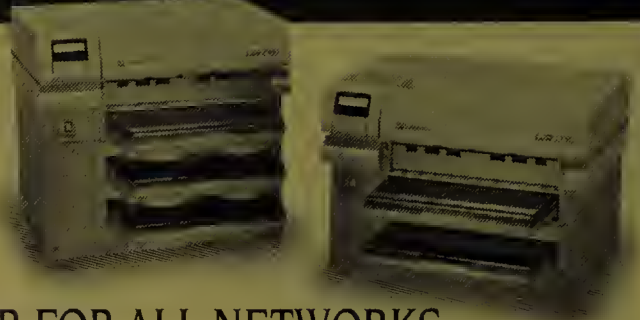

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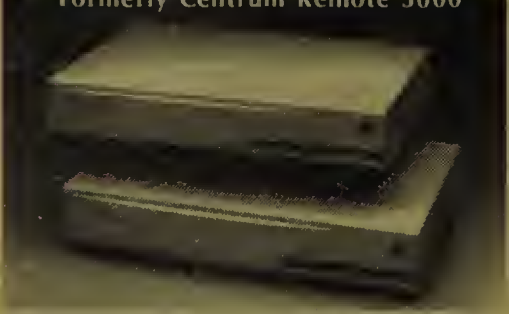

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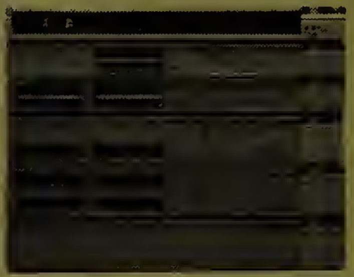

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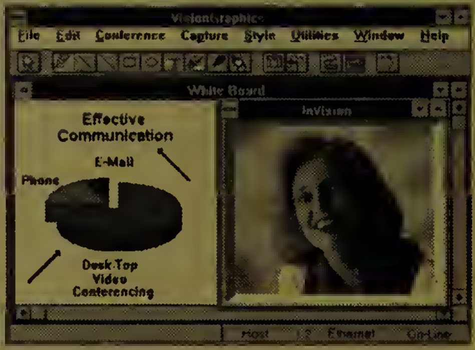

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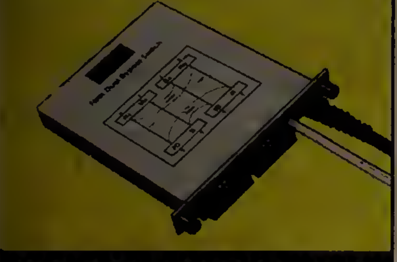

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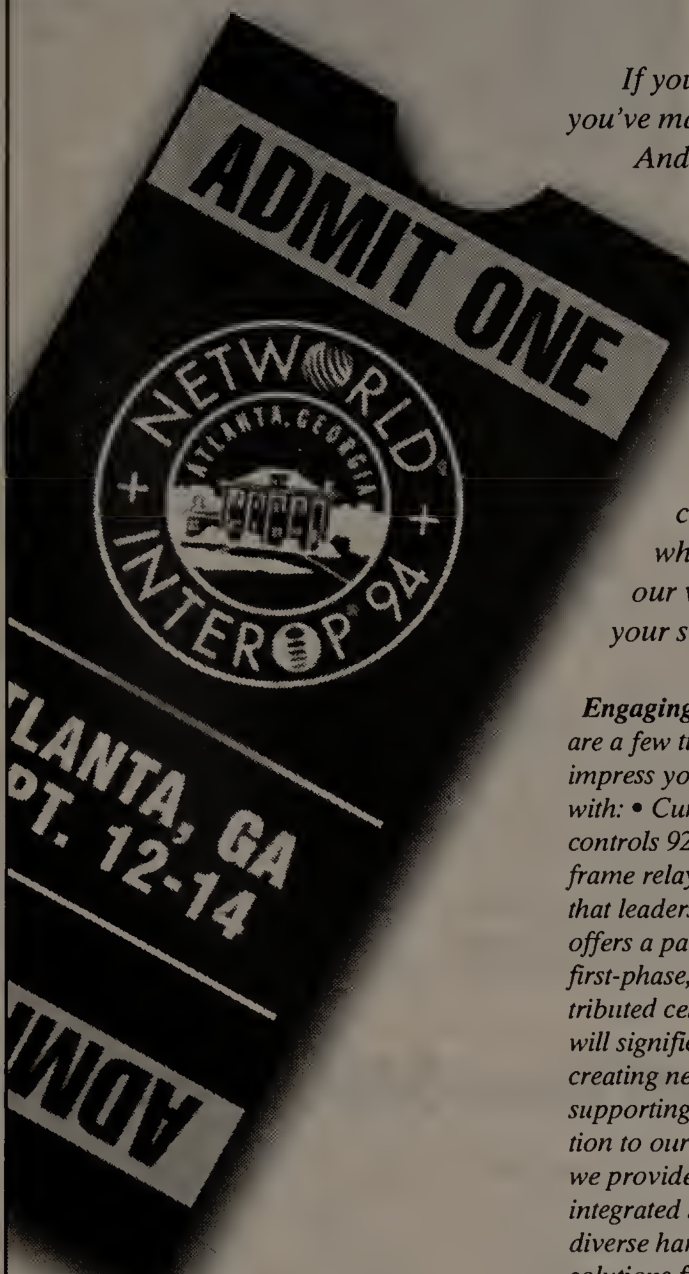

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ATM

Continued from page 1

includes three classes: A, C and X.

Class A is a constant bit rate service comparable to private lines. Class C offers variable bit rate services for data applications.

Class X provides an "unspecified bit rate," meaning it delivers cells at a variable bit rate depending upon network capacity available at any given point in time. It is intended for applications such as large file transfers that are not necessarily time-sensitive.

Reality ☑ Check

Product: HyperStream ATM
Company: MCI

The benefits:
- Scalable from T-1 to OC-3 speeds.
- Broad range of service classes.
- Flexible access options.

The drawbacks:
- ATM technology is still maturing.
- Inefficient for low-speed applications.
- Does not address integration of cell-based voice.

The user view:
"MCI's support throughout our trial has been excellent. They have been highly responsive and interested in exploring a wide variety of broadband applications in order to better understand the features the network must include."

Richard Upton, The Analytic Sciences Corp.

MCI will offer two types of permanent virtual circuits (PVC), virtual connections and virtual paths, with all three service classes.

The virtual connection is equivalent to a PVC with frame relay services today, except that the user can designate not only the sustained cell rate (or committed information rate in frame relay) but also the peak cell rate and the maximum burst size.

A virtual path is a large pipe that includes many virtual connections; it can be used today for SVC tunneling — a proprietary form of SVC supported by some ATM user premises equipment vendors — and other applications where the flexibility to quickly establish individual virtual connections is required.

The range of interface options supported include T-1, T-3 and OC-3, and MCI will use primarily OC-3 trunking between its switches.

"Scalability on the interface is critical to ATM's early success," said Stephen VonRump, MCI's director of data product marketing.

More interface options will be available next year, when MCI comes out with support for the ATM data exchange interface (DXI).

DXI will help users bridge the gap between T-1 and T-3 local access alternatives by providing support for 3M, 6M, 9M and 12M bit/sec speeds, or any other T-1 increment, without requiring T-3 access to support such speeds, said John Navai, senior manager of HyperStream product development. The ATM DXI interface could be used by MCI customers with T-3 access, where some of the services on the local loop could be voice, private lines or frame relay, and the remaining bandwidth could be used for the ATM applications.

MCI has already submitted a contribution to the ATM Forum for supporting the DXI interface as an ATM service standard.

The interface is also key to satisfying the needs of the government agencies, large computer manufacturers and other high technology companies that MCI expects to be among the first to implement ATM.

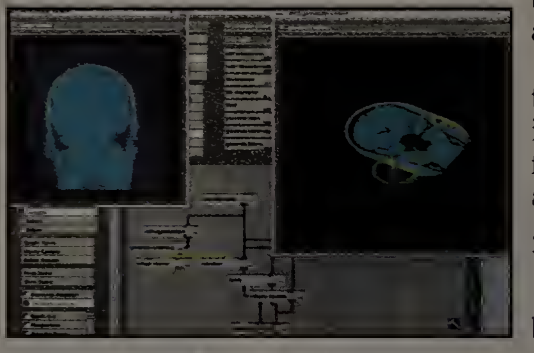
"Their connectivity needs range from 1.5M up to 45M bit/sec and beyond," VonRump said. "We knew that to address the requirements of these customers we would have to support everything from T-1 to OC-3 in the initial release, and this was an important factor in our choice of equipment vendors."

GDC LANDS A BIG ONE

Enter GDC's Apex ATM switch, which provides a 6.4G bit/sec switch fabric and supports MCI's interface and trunking requirements.

MCI, which evaluated nearly every major ATM vendor's switch, based its initial six-site ATM test network deployed in June 1993 on the Northern Telecom, Inc. Magellan Gateway ATM switch. But MCI thought the Magellan switch, like the other first-generation ATM switches, fell short in several critical areas such as congestion management, net control and scalability.

"First generation ATM switches typically have very small buffer capacities," Navai said, "and this affects the quality of services you can support — and the types, as well."



TASC is using MCI's ATM service to transmit images like this MRI scan.

Another issue for MCI was automated and centralized network control for quicker and more accurate implementation of customer networks.

The Apex switch provides MCI with automated setup of virtual connections end to end and much better network management than the other ATM platforms MCI evaluated, according to VonRump.

Although MCI is not yet disclosing HyperStream ATM pricing details, it has indicated it will use a fixed-rate pricing structure through the end of this year.

In early 1995, the carrier plans to add usage-based pricing options.

Consistent with its private-line and frame relay pricing, MCI's ATM pricing structure will have mileage-sensitive elements across all service classes.

One of MCI's first beta customers, the U.S. government's Joint Interoperability Test Center (JITC), could be one of the first clients on the new commercial ATM network because it recently chose to extend its trial through December of this year.

"The test bed has been a big success so far," said George Whitehead, senior engineer of the Information Transfer Directorate at JITC. "We have extended ATM into the legacy network systems within the trial war theater over line-of-sight microwave, and it worked great."

Another customer, Dr. Richard Upton, director of visual communications at The Analytic Sciences Corporation (TASC), said he has successfully tested applications in several areas, including telemedicine, distributed visualization, high-resolution image databases, video transport and Internet services.

"[We have] found that the ATM network is a fantastic solution for transporting visually intensive data sets ... across the country," Upton said.

TASC, which has been testing the service for a year, is using it to transmit three-dimensional patient images, such as magnetic resonance image (MRI) brain scans, between computers in Massachusetts and Texas. Doctors can remotely view and manipulate the images, helping to improve health care quality and distribute expertise.

TASC is also working with weather simulations and visualizations, and other advanced image-based applications.

BUSY YEAR IN '95

Looking ahead to next year, MCI plans to expand the net beyond the 11 switches it will deploy by the end of 1994 and will introduce frame relay and Switched Multimegabit Data Service interoperation with ATM services.

Also in 1995, MCI will add switched virtual circuits and more service classes, including Classes B and D.

The Class B service, intended for use with video applications, will be launched following the completion of the Motion Picture Experts Group standard, scheduled for next year. Class D service, which is intended to support connectionless ATM service and data applications, will be provided by interconnecting MCI's SMDS network with the ATM network, to provide native-mode SMDS over ATM.

➻ Heckart is a senior consultant at TeleChoice, Inc., a Verona, N.J., consultancy. She can be reached at (201) 239-0700 or via MCI Mail at 445-4690.

MCI offers SMDS bypass

MCI last week extended the tentacles of its Switched Multimegabit Data Service via a new dedicated connectivity option and a deal with GTE Telephone Operations.

SMDS is a public net service that functions like a "wide-area LAN" to allow users to communicate on the fly without predefining transmission paths. It is one option for ATM Class D (connectionless) service.

Users in areas where local carriers do not provide SMDS access can now connect directly to MCI's SMDS network via a dedicated line. Link speeds range from 56K to 1.544M bit/sec.

In addition, the carrier has allied with GTE to provide SMDS interconnectivity between MCI's network and local GTE SMDS nets in Ontario, Long Beach, and Santa Monica, Calif.; Irving, Texas; Tampa, Fla.; and Seattle.

MCI is the only long-haul carrier offering SMDS and already provides interconnections to Bell Atlantic Corp., BellSouth Corp. and Pacific Bell SMDS nets. It is negotiating with US WEST, Inc. and Ameritech Corp. for linkages, as well.

Neither Southwestern Bell Co. nor NYNEX Corp. offers SMDS, so national SMDS users might consider MCI's dedicated connectivity option in these areas. MCI is taking orders now, and service will be up in the fourth quarter, the carrier said.

Nodes linked directly to an MCI SMDS point of presence will function as full SMDS net participants. However, the T-1 ceiling on dedicated access will hamper those users seeking broadband speeds.

MCI's dedicated option "would be good from a connectivity standpoint, but I need bandwidth — that's my problem," said Joe Bumblis, lead analyst at 3M Corp.'s information technology group in Minneapolis.

3M uses local 4M bit/sec SMDS from US WEST and is seeking long-distance links to Austin, Texas. Most local carriers offer SMDS in increments of 56K/64K, 1.544M, 4M, 10M, 16M, 25M and 34M bit/sec.

BY JOANIE WEXLER

Lotus-HP

Continued from page 1

more powerful messaging networks and help both vendors fend off Microsoft Corp.'s planned Microsoft Exchange Server.

"We're going through some technical negotiations to see what can be done," said Andrew Ransom, communications program manager in the HP Cooperative Computing Systems' division. But no specific integration goals or timetables have been set, he added.

Lotus officials could not be reached for comment by press time.

Notes provides database replication, workflow, conferencing and security using a proprietary message store and transport. OpenMail, which runs on powerful Unix servers from HP, IBM and Sequent Computer Systems, Inc., provides X.400 message transport and works with HP's OpenView management system.

The two firms have worked together to create an OpenMail client for Notes users that is shipping and to build a Notes server for HP-UX systems that could ship within weeks.

But HP and Notes have yet to team to the degree that OpenMail and Notes can run on a single server or share some of their stronger features, Ransom said. For example, while a Notes user can employ an OpenMail client to send an E-mail message across an X.400 net, the message would require access to a Notes server in order to support workflow triggers. And OpenMail's management services cannot be used to monitor the status of Notes servers.

Combining the two would make for more efficient networks simply by reducing the total number of servers, Ransom said.

The potential OpenMail/Notes server alliance is "very heartening," according to Jeff Held, a partner in technology service at consulting firm Ernst & Young in New York, which is trying to figure out how to create a messaging and groupware infrastructure for its worldwide operations.

A OpenMail/Notes offering would let the firm extend the Notes-based E-mail applications it has already developed, Held said. Currently, these cannot run across third-party messaging servers because they depend on access to the proprietary Notes database.

Mike Rothman, an analyst with the META Group, Inc. consulting firm in Reston, Va., said an OpenMail/Notes combo could prove particularly attractive to firms with several thousand users on a single campus — all of whom could connect to a single OpenMail server.

However, he said tight integration between the two products could raise questions about Lotus' planned Lotus Communications Server, due out by mid-1995, which is supposed to provide many of the same standards-based management and messaging functions as OpenMail. ☒

3Com

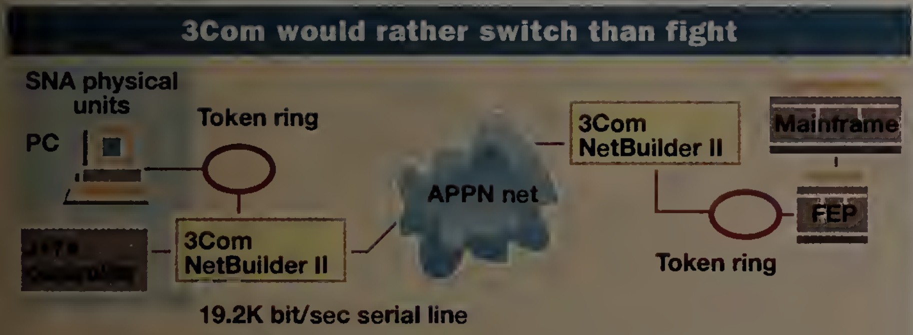
Continued from page 1

That means users will not have to upgrade to VTAM 4.2 to support SNA across APPN, nor will they have to equip thousands of SNA devices with dLUR software.

3Com will follow up later next year with DLSw software that tunnels protocols other than SNA and Network Basic I/O System — such as Digital Equipment Corp.'s Local Area Transport (LAT) — through TCP/IP or any other protocol.

In the last, and possibly most significant, phase of its strategy, 3Com will couple DLSw with IBM's High Performance Routing (HPR) for higher performance transmission of encapsulated data.

3Com plans to submit its work to the APPN Implementor's Workshop and the Internet Engineering Task Force (IETF) for ratification.


3Com would rather switch than fight

3Com's plan to support DLSw over APPN could free users from having to equip PU 2 devices or routers with dLUR and mainframes with dLUS software.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: 3COM CORP., SANTA CLARA, CALIF.

Users said 3Com's plan is interesting, but they are not totally sold.

"I'm not quite sure how they can do what they say they can do," said Lionel Geltman, assistant vice president of Nomura Research America of New York. "The futures have some interest, but it's not practical right now for us."

DLSw, as specified by the IETF's RFC 1434, outlines a method for routing SNA and NETBIOS traffic through an IP backbone by encapsulating it in IP packets. But 3Com claims RFC 1434 is not limited to TCP/IP. "There are other protocols people are tunneling that we think DLSw may [apply] to," said Philippe Byrnes, product manager for SNA internetworking.

3Com will accommodate SNA users migrating to APPN in a new release of NetBuilder II software, slated for second-quarter 1995, that couples DLSw with APPN.

Using DLSw to tunnel SNA and NETBIOS traffic through APPN has several benefits, 3Com officials said. First, APPN is connection-oriented, meaning response will be more reliable and predictable than with connectionless protocols such as IP. Second, users can take advantage of the eight classes of service that APPN defines to select routes and set up transmission groups for high-priority traffic.

DLSw over APPN can also mimic the functionality of dLUR and dLUS, 3Com said. DLUR and dLUS are interdependent LU 6.2 software programs that route legacy SNA traffic natively through APPN backbones.

IBM is requiring users to upgrade to VTAM 4.2, which includes dLUS, if they want to support legacy SNA data on an APPN backbone. DLSw over APPN can be used with older versions of VTAM, obviating the need for that upgrade.

Just as DLSw can be used with "tunneling" protocols other than TCP/IP, it can also tunnel protocols other than SNA and NETBIOS, Byrnes said. 3Com will prove that in the second phase of its DLSw initiative when it releases an upgrade to NetBuilder II software in the second half of 1995.

Byrnes would not disclose which protocols that version of NetBuilder will tunnel using DLSw, but one of the most widely deployed nonroutable protocols after SNA and NETBIOS is Digital's LAT.

But the real benefits of 3Com's DLSw strategy will not be realized until Phase 3, when the vendor couples DLSw with IBM's HPR, analysts said. HPR is intended to enhance APPN performance, and bring it up to speed with TCP/IP, by dynamically rerouting around failures, improving data flow control and providing more class-of-service features.

"With HPR, by IBM's estimates, you're talking about a three- to 10-times improvement in throughput," said Don Czubeck, president of consultancy Gen2 Ventures in Saratoga, Calif. "That would result in a very high-performance enterprise backbone that would be capable of handling any number of different protocols. Even a TCP/IP user would benefit."

3Com plans to release software that supports DLSw over HPR within the next 24 months.

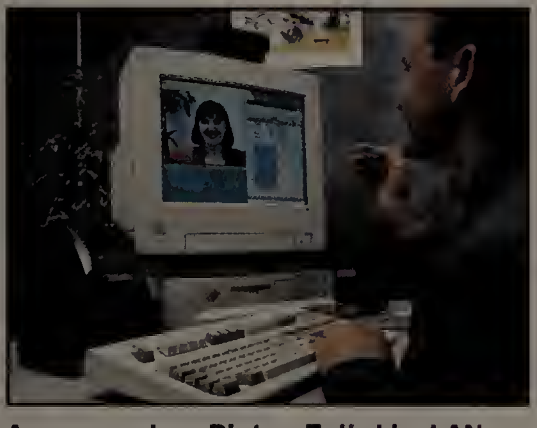
PictureTel

Continued from page 4

video capture card.

A LiveLAN session consumes from 128K to 256K bit/sec of bandwidth for its 15 frame/sec video — half of the 30 frames common for full-motion video.

LiveLAN got a cool reception from analysts, who said PictureTel may have rushed it out in response to competing LAN-based products from vendors such as InSoft Corp. and EnVision Systems Corp. InSoft and EnVision desktop video products work over both LANs and a number of wide-area services.


A user employs PictureTel's LiveLAN.

LiveLAN won't even work with PictureTel's desktop system, PCS Live, until a gateway is released in mid-1995, said Abhijeet Rane, senior analyst at consultancy Link Resources Corp. in New York.

PCS Live, which has only sold about 600 units in over a year, works with dial-up ISDN and switched services but not on a LAN.

"I wouldn't even try to convince management to buy a product that can only videoconference on a LAN today," said Howard Lapointe, videoconferencing manager at MasterCard International, Inc. "It's just taking up bandwidth."

PictureTel has quality room-based systems, but it would be hard to muster interest in LiveLAN until PictureTel delivers the transcoder, Lapointe added.

The company is promising further advances in the product by mid-1995, including TCP/IP and multipoint support.

LiveLAN will be sold separately as four components. LiveLAN-A, the audio and data-sharing software, which will ship this October, will cost $249 per desktop. LiveLAN-V, the video support, will ship in January for $395. LiveManager, the bandwidth manager, will ship in October for $595. Pricing for the transcoder, to ship in mid-1995, has not been announced.

Complete starter kits for five LiveLAN-A units and one LiveManager license will cost $1,395.

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Switch

Continued from page 1

those virtual LANs.

The objective of these devices is relatively simple: Convert traffic from packet-based LANs into fixed-length cells for transport into ATM networks.

For Tim Kuhfuss, manager of high-speed networking at Argonne National Laboratories in Chicago, investment in a border switch was a tactical decision.

Argonne supports a large number of researchers who need real-time, high-bandwidth access to scientific network resources and instruments, so Kuhfuss opted for ATM early on.

"Getting my Ethernet-attached workstations a reliable video feed or large amounts of data from a real-time experiment taking place on our ATM net is one of my biggest challenges," Kuhfuss said. "ATMizer allows me to bridge the gap between those two environments in a very slick way."

Others have different reasons for employing the device.

"Our router-based backbone is starting to buckle somewhat," said Chuck Von Lichtenberg, network systems manager at Boston University. "While we evaluate how ATM may help us relieve some of those bottlenecks, we can employ a device like ATMizer to introduce switching into our environment and get some breathing space."

As an example, Von Lichtenberg cited the school's Unix cluster, which consists of four high-performance servers that support more than 15,000 user accounts via multiple Ethernet connections. The combination of ATM links to the servers and switched Ethernet connections to the clients — both provided by ATMizer — results in faster, more reliable access.

Jeff Marshall, senior managing director at Bear Stearns & Company, Inc., needs a border switch to create a series of virtual LANs that let information be shared more efficiently.

"In environments like mine . . . everyone needs access to the same information almost simultaneously," he said. "ATMizer gives me the flexibility to link users together as needed no matter where they're located in the building."

The problem then becomes how to ship traffic between virtual LANs.

"The border device needs to have some routing in it because if a user is going to be part of six virtual LANs with different characteristics, then the box has to address how it will get [data] between his environments," Kuhfuss said. "Like the ATMizer, it needs some routing intelligence so it can interact with the existing backbone router smoothly."

Devices from NetEdge and Xylan also support some routing, while switches from Centillion and NiceCom do not.

Since these border switches provide such a broad range of functionality, network management is another key area to evaluate.

"Since some of these devices offer frame switching, cell switching, segmentation and reassembly, bridging and routing functionality in one enclosure, it's easy to see how managing them can quickly become a nightmare," Marshall said. "At the very least, they have to keep up with the network in terms of moves, adds and changes. ATMizer can do that automatically."

Xylan's OmniSwitch and PizzaSwitch also have the ability to automatically discover a user has moved and reconfigure his connection so he retains the same access rights.

Compliance with standards and interoperability issues will become increasingly important as products from more vendors become available.

"If you want to build virtual workgroups right now that can access ATM networks, then you have to stick with one vendor," Kuhfuss said. "Standards and interoperability will become more critical down the road."

NETWORK WORLD

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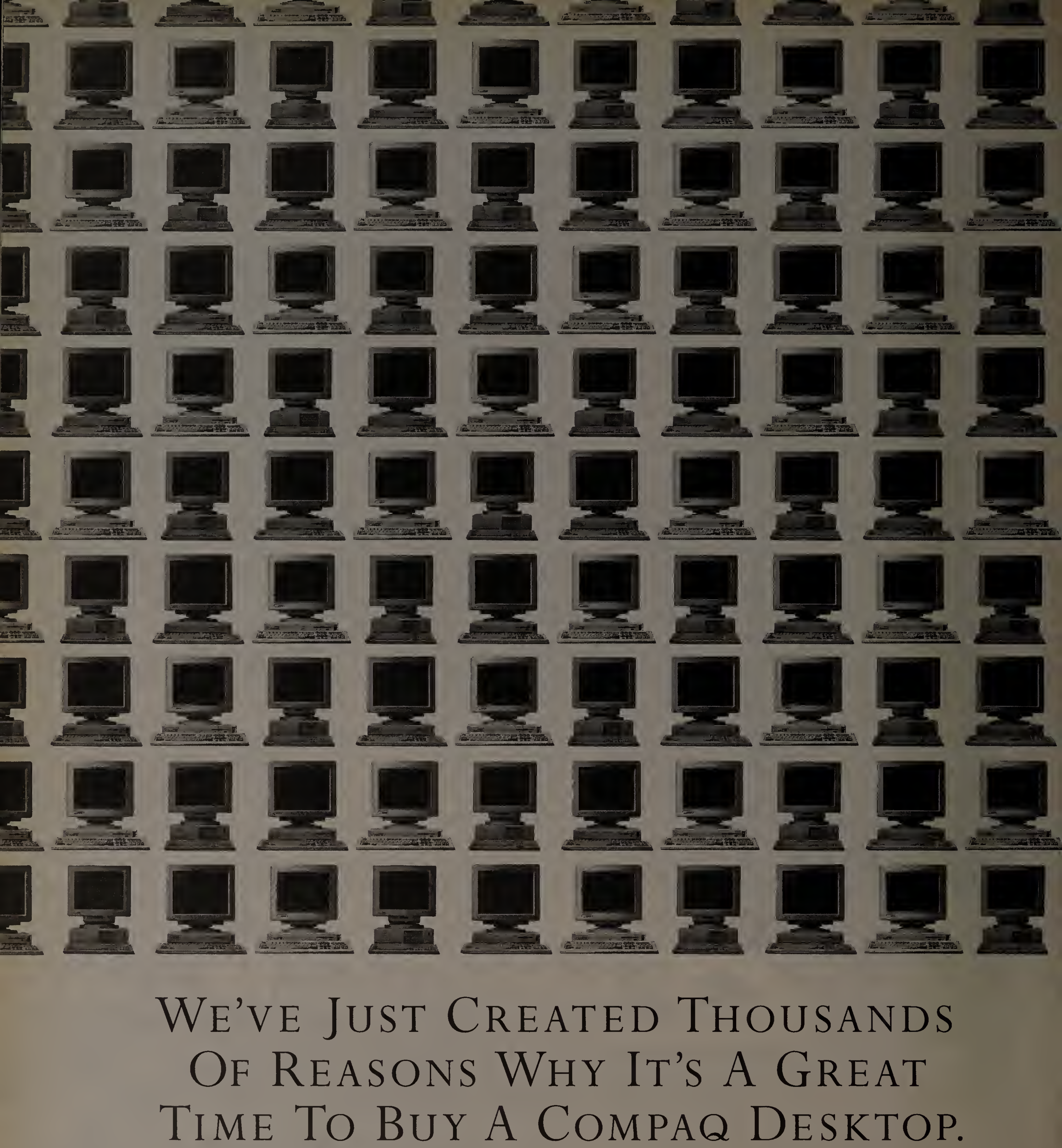

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